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United States Coast Guard

Commandant
United States Coast Guard

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COMDTINST M13020.1E
APRIL 30 1998

COMMANDANT INSTRUCTION M13020.1E

Subj.: AERONAUTICAL ENGINEERING MAINTENANCE MANAGEMENT MANUAL

1. PURPOSE. This letter promulgates the new issue of the Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1E. Policies and procedures are outlined for the aeronautical engineering Community.

2. ACTION. Area and district commanders, maintenance and logistics commands, and commanding officers of headquarters units shall ensure compliance with the provisions of this manual.

3. DIRECTIVES AFFECTED. COMDTINST M13020.1D is canceled.

4. DISCUSSION. This manual supersedes COMDTINST M13020.1D dated 10 March 1995 in its entirety and reflects changes in mission, processes, and responsibilities. A vertical line in the margin marks the signigicant changes. Editorial changes are not marked; accordingly a thorough reading is required.

5. CHANGES. Recommendations for improvements/changes to the Manual shall be submitted via the chain of command using the CG-22 form. This Manual will be reviewed on a regular basis.

6. FORMS AVAILABLITY. Forms addressed in the manual are available as listed in the Catalog of Forms, G-SEA Forms Plus, Laser Library, or Aviation Computerized Maintenance System.

/s/ John T. Tozzi
Assistant Commandant for Systems

Encl: (1) Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1E

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Robins AFB (4)

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CHAPTER 1. MAINTENANCE MANAGEMENT POLICY

A. GENERAL. This manual provides a summary of the objectives, policies, organizational structures, and responsibilities which form the foundation for the United States Coast Guard (USCG) aeronautical maintenance management system. This system is a composite of United States Air Force (USAF) and Navy (USN) systems, commercial procedures, and USCG developed procedures. The procedures required for uniform and effective management of aeronautical maintenance resources are contained herein.

B. MAINTENANCE SYSTEM OBJECTIVE. The system objective is to ensure, in the most cost-effective manner, that assigned materiel is serviceable (safe and operable) and properly configured to meet mission requirements. This is accomplished by performing maintenance, including but not limited to, inspection, repair, overhaul, modification, preservation, testing, and condition or performance analysis. Emphasis is placed on planning and scheduling these tasks, by supervisors, to allow timely accomplishment through the efficient use of personnel, facilities, and equipment. Proper planning reduces unscheduled maintenance events and allows for an orderly progression of maintenance actions toward returning materiel to a safe and operable condition.

C. EQUIPMENT READINESS. The key to a unit's mission success is its sustained ability to provide safe, reliable, and properly configured equipment at the time and place it is required. The degree of equipment readiness at an operating unit should be put in context with the assigned mission. Failure to recognize the extent of equipment readiness required may result in excessive acceptance of equipment deficiencies and a maintenance backlog. On the other hand, unrealistically high readiness requirements may cause essential maintenance to be deferred, with the same result. Either extreme serves to reduce a unit's mission capability. Commanding Officers should ensure equipment is made available for maintenance when the resources are available. It is his or her responsibility to ensure that maintenance is completed in an orderly and timely manner to meet the assigned mission requirements.

D. MAINTENANCE SYSTEM ORGANIZATION. Three basic elements comprise the aeronautical maintenance system: a management element, a technical element, and a production element. Additional information concerning the duties and responsibilities of these elements is addressed in succeeding chapters of this manual.

1. Management Element. The Aeronautical Engineering Division, Commandant (G-SEA) at USCG Headquarters has primary responsibility for the management element and serves as a focal point for technical and engineering support for systems and equipment in the operational inventory.

2. Technical Element. The Aircraft Repair and Supply Center and field units designated "Prime Units" perform the major share of the technical element of maintenance engineering under the direction of Commandant (G-SEA).

3. Production Element. Operating activities are concerned primarily with maintenance production and provide the basic data inputs for maintenance engineering decisions. Maintenance production is the physical performance of equipment maintenance and related functions such as servicing, repairing, testing, overhaul, modification, calibration, conversion, and inspection. These tasks are performed at two levels: unit and depot.

   a. Unit-Level Maintenance. USCG unit-level maintenance includes both the Department of Defense (DOD) levels described as organizational and intermediate. Individual units have the responsibility to perform unit level maintenance on their assigned equipment. This normally consists of inspecting, servicing, lubricating, adjusting, and replacing components, minor assemblies, and subassemblies. It also consists of calibrating, repairing or replacing damaged or unserviceable parts, components, and assemblies; modifying materiel, emergency manufacturing of unavailable parts; and developing/providing internal technical assistance.

   b. Depot-Level Maintenance. Designated maintenance activities perform depot-level maintenance to augment stocks of serviceable materiel and support unit level maintenance activities. These depots have more extensive shop facilities and equipment,

and personnel of higher technical skill than are normally available at the lower levels of maintenance. This usually consists of repairing, modifying, overhauling, reclaiming, or rebuilding parts, assemblies, subassemblies, components and end items; emergency manufacturing of unavailable parts; and providing extensive, detailed technical assistance to using activities. Depot level maintenance is normally accomplished by ARSC and other overhaul activities designated by Commandant (G-SEA).

E. MAINTENANCE STANDARDIZATION. Standardized maintenance improves overall maintenance quality, capability, and reliability. The required level of standardization will be achieved through application of the maintenance management procedures prescribed by this manual.

F. MANAGEMENT ACTIONS ON INSPECTION REPORTS. Inspection reports, whether from unit quality control or other inspections, are valuable management tools that must be given special attention. Positive action is required to identify and eliminate the causes of the specific defects noted. Supervisors should ensure that responsible individuals are made aware of deficiencies and become involved in correcting the problems. Review of corrective actions is incumbent on the Commanding Officer and Engineering Officer to ensure underlying causes for discrepancies are identified and rectified to preclude recurrence.

G. MAINTENANCE CAPABILITY. Maintenance capability is the ability of a unit to maintain assigned equipment in serviceable condition and proper configuration. Development of this capability begins with systems requirements definition for acquisition. Systems requirements analysis is performed to determine the system capabilities, adequacy of the requirements definition, and whether the systems meet these requirements. While defining requirements and determining capabilities, the system requirements analysis also develops the overall system maintenance philosophy. The overall maintenance philosophy determines both the depot and unit level maintenance capabilities. This determination is based on the requirement for unit-level maintenance to support the mission, and the cost effectiveness of in-house depot-level capability. The unit capability is then translated into resources of unit facilities, billets, and the unit spares allowance list, which drives procurement and positioning of spare parts. Engineering Officers must gauge their maintenance capability when planning to meet mission requirements. If maintenance capability is exceeded for extended periods, maintenance quality will suffer, and ultimately, mission requirements will not be met and safety will be compromised.

1. Maintenance Work Hours. Because the number of maintenance work hours available is limited, the Engineering Officer must take considerable care with this resource. Every effort should be made in maintenance plans and schedules to ensure personnel are productively employed throughout their workshift.

2. Sparing Levels. Sparing levels of critical components and piece-parts are based on a predicted mean time between failure. Service-wide budgetary restrictions also impact levels of sparing through reduced funds for parts buys and contracted rework. To prevent shortages elsewhere in the eet, Engineering Officers should ensure only the authorized level of sparing is maintained. They must be innovative, making use of supply practices such as parts pooling.

3. Maintenance Capability and Mission Accomplishment. The relationship between maintenance capability and successful accomplishment of the mission must be clearly understood. When resource deficiencies exist, the Engineering Officer should request and justify additional resources to support a continuous workload or request temporary assistance to perform emergency workloads. Assistance may be requested to perform maintenance beyond the unit's capability. The Personnel Resources Manual, COMDTINST M5312.13 (series), provides guidance, policy, and procedures on the subject of Personnel Resources. Where resources (parts or personnel) are not available or cannot be made available, reductions in mission requirements may be necessary.

H. MAINTENANCE EFFECTIVENESS. The Aeronautical Engineering system provides integrated logistical support for all aspects of Coast Guard Aviation. When fully effective, the Aeronautical Engineering system produces aircraft that satisfy operational requirements in a reliable, maintainable, and supportable fashion.

A system of measurements of effectiveness (MOEs) indicates the performance of Coast Guard Aeronautical Engineering as related to strategic plans and goals. This MOE system consists of multi-dimensional indices and individual data points. These are taken collectively and considered over time to adequately reflect overall system performance. A Measures of Effectiveness Report (described in detail in Chapter 4.) for all of Coast Guard Aeronautical Engineering is produced semiannually and distributed among selected managers on the Commandant (G-SEA) staff and at ARSC. Engineering Officers at Air Stations must also monitor and measure the effectiveness of their maintenance efforts.

I. AIRCRAFT AVAILABILITY. Availability of aircraft to perform operational missions is dependent on a wide range of variables. These include availability of flight and maintenance crews, special tools, ground support and launching equipment, spare parts, fueling apparatus, and other factors too numerous to mention. An Availability Index indicates the percentage of time that aircraft assigned to Air Stations are available to perform Coast Guard missions. It is defined as follows:

AI=[100-NMCT] where
NMCT=Not Mission Capable Total = NMCM + NMCS + NMCD (units) and
NMCM is Not Mission Capable due to Unit-Level Maintenance
NMCS is Not Mission Capable due to Supply
NMCD (units) reflects the portion of Not Mission Capable Time due to Depot-Level Maintenance which is performed at a unit

1. Definition.

   a. NMCM is the status of an aircraft which is Not Mission Capable because unit-level scheduled or unscheduled maintenance work (as defined in paragraph 1.D.3.a.) is in progress. NMCM time also includes the time the aircraft is grounded awaiting maintenance action or until the satisfactory completion of a test flight. Pre-thru-post flight inspections or servicing which would not delay a B-0 launch should not be logged as NMCM time. NMCM time does not include periods when the aircraft is down undergoing depot level maintenance (such as during drop-in depot-level maintenance performed at either ARSC, contractor sites, or other depot facilities, or during periods when depot field teams are performing depot-level work at an Air Station).

   b. NMCS is the status of an aircraft which is Not Mission Capable due to the lack of available parts or supplies. The NMCS `clock' starts when an aircraft is incapable of meeting mission readiness requirements, and corrective maintenance is being postponed because a required part is unavailable. The part should be acting as 'show-stopper', i.e., its lack of availability is preventing maintenance from proceeding, and thereby acting as the driving factor causing the NMC condition. The NMCS clock stops as soon as the part is available to maintenance personnel. The NMCM clock starts at that point and stops again once the aircraft resumes Bravo readiness status. NMCS should reflect cannibalization. For example, once a part is removed from an airframe (for installation on another airframe) it should be listed as NMCS. The status of the airframe receiving the cannibalized part should switch from NMCS to NMCM.

   c. NMCD reflects the percentage of time that aircraft of each type are unavailable for operational use at Air Stations due to scheduled or unscheduled depot level maintenance. Most NMCD time will be accrued at ARSC and contractor or DOD depots, but occasionally the Coast Guard makes a `business decision' to perform depot level maintenance at Air Stations. These NMCD periods need to be reflected in the total NMCD time, and should not count against unit NMCM rates. The criteria for accumulating NMCD time at the various locations are:

      (1) At Units (reported through the ASR form):

         (a) When depot level maintenance is performed by ARSC or Contractor Field Teams.

(b) When unit personnel perform a depot level repair or modification authorized by ARSC.

(c) When unit aircraft are sent for Drop-in Maintenance at either ARSC or contractor sites.

(2) At Depots (ARSC and contractors):

(a) NMCD accumulated at depots includes PDM, Drop-in Maintenance, and all other depot level maintenance performed at the depot.

(b) Collected monthly by ARSC for each aircraft type.

(c) A percentage that is equal to the average number of an aircraft type in the depot divided by the total number of an aircraft type in the Coast Guard inventory. The average number of an aircraft type in the depot for a given month is calculated by dividing the total depot process days for that aircraft type by the number of days in the month.

2. NMCT Target. The USCG target for aircraft availability is 71% (which equates to an NMCT of 29%). This is the goal for mature aircraft systems, but is only one of many indicators of maintenance effectiveness. The MOE report should be referred to if a picture of maintenance effectiveness is required.

3. NMCS Target. A target of 5% is a planning goal for NMCS rates (this equates to a parts availability rate of 95%). This target also serves as a justification for resources required to meet an NMCT rate of 29%. However, the Coast Guard must strive to meet these targets at minimum total system costs. The greatest efficiencies can be realized through minimizing inventory investment at ARSC and in unit allowances consistent with this goal.

J. MAINTENANCE DOCUMENTATION. Documentation is an essential part of maintenance management. The objective of maintenance documentation is to provide the Engineering Officer with timely, complete, and accurate maintenance production data for planning, control, and analysis, and to provide an accurate record of completed work. It also provides performance data to managers at all levels and is essential in the development of a maintenance management information system.

K. FINANCIAL MANAGEMENT. Management of funds plays a key role in maintenance. The Engineering Officer is responsible for financial planning, preparation of budget requirements and controlling expenditures within budget allocations. Exact procedures will vary among operating units; however, the primary goal of financial management at the unit level is to receive the maximum benefit from the funds available.

1. Responsibilities. The Manual of Budgetary Administration, COMDTINST M7100 (series), provides detailed information concerning the responsibilities of the various levels of the USCG organization regarding administration of appropriate funds. All personnel involved in the planning for, or expenditure of, appropriated funds should have a working knowledge of the system described therein.

2. Allocation of Funds. Operating aviation units receive funds under AFC 30. Each Maintenance Logistics Command (MLC), district, and operating activity has developed procedures for the allocation of these funds within their areas of responsibility. Commanding Officers have final authority regarding the suballocation of funds to various departments. The Engineering Officer should ensure that planning for and expenditure of assigned funds is consistent with the overall objective of the unit maintenance plan.

L. CANNIBALIZATION. Cannibalization is the removal of a specific assembly, subassembly, or component from one equipment end item for installation on another to meet mission requirements. Cannibalization is a costly practice in terms of time, man-hours, documentation, and damaged equipment. Cannibalization shall be closely controlled and monitored. All cannibalization actions shall be authorized by the Engineering Officer or his or her designated representative.

NOTE

Certain components either cannot be cannibalized or require special procedures in the event of cannibalization. Refer to the aircraft type specific ACMS Maintenance Procedure Card (MPC) for guidance, if applicable.

NOTE

Cannibalization will be logged on the CG-5181, Carry Forward Discrepancies Form, unless the aircraft is in temporary storage (14 days or longer) or ACMS has been suspended, in which case entries will be permitted on the CG-4377B, NO FLY.

M. MODIFICATION AND CHANGES TO AIRCRAFT.

1. General. The Commandant encourages improvement of USCG aircraft while preserving standardization and providing guidance to accomplish aircraft modification or change projects. These instructions are intended to supplement any general instructions governing aircraft testing. The term aircraft, as used in this sense, includes related systems and ground support equipment. Refer to paragraph 11.C.4. for more specific guidance on avionics components.

2. Changes or Tests. No modifications or changes will be made without authorization from the Commandant (G-SEA). No in-flight testing will be conducted without authorization from Commandant (G-OCA). Authorization to change an aircraft or make tests may be granted, provided that none of the following is adversely affected: structural loads, aerodynamic characteristics, weight and balance, or performance.

3. Procedures.

   a. Operational Requirements. Recommendations for changes or modifications to fulfill operational requirements or improve mission performance shall be addressed to the facility manager, Commandant (G-OCA); copy to the system manager, Commandant (G-SEA).

   b. Correction of Materiel Defects. Recommendations for changes or modifications to correct materiel defects or unsatisfactory conditions (including avionics) will normally be submitted by Unsatisfactory Report (UR). Urgent safety of flight materiel defects should be submitted in message format.

   c. Aircraft Configuration Control Board (ACCB). The USCG ACCB will review and recommend changes to standard aircraft configuration. The ACCB recommendations will be subject to joint final action by Chief, Aviation Division and Chief, Aeronautical Engineering Division. See the ACCB Process Guide, CGTO PG-85-00-70, for specific information.

   d. Prototype Installation. Prototype installations are authorized by the Commandant (G-SEA) after feasibility approval has been granted by the ACCB. The prototype facility is responsible for advising the appropriate Standardization Unit when the design has reached the stage where procedures may be developed for flight handbooks. With the proper prior operational consultation in Phases I and II of the ACCB proceedings, this will not become a redesign process for the change.

      (1) Trial Installations. A trial installation is normally performed by the Prime Unit. The trial installation verifies all aspects of the modification, including installation procedures, parts, and changes to operating and maintenance procedures.

   e. TEMPEST Testing. TEMPEST testing at a certified DOD TEMPEST facility is required for each prototype or initial fielding of a new Communications Security (COMSEC) system. TEMPEST testing for prototypes of modified COMSEC systems or equipment shall also be required except when specifically exempted in writing by the CG ARSC Field Technical Authority (FTA) or other qualified DOD authority.

4. Coast Guard Aviation TEMPEST Program.

a. TEMPEST. TEMPEST is an unclassified short name referring to investigations and studies of compromising emanations.

b. TEMPEST Responsibilities:

(1) Commandant (G-SEA): Commandant (G-SEA) will oversee the overall Coast Guard aviation TEMPEST program. Commandant (G-SII), as the Coast Guard TEMPEST Authority, will provide Commandant (G-SEA) with National, Department of Transportation, and Coast Guard TEMPEST policy.

(2) ARSC: ARSC shall manage the Coast Guard Aviation TEMPEST policy as directed by Commandant (G-SEA). ARSC shall ensure conformance with current Coast Guard TEMPEST policy. This will include, but not be limited to the following:

(a) Perform TEMPEST tests for each COMSEC equipment new installation or modification in each type or model of aircraft.

(b) Perform TEMPEST surveys for each aircraft during each overhaul and as required by the Field TEMPEST Authority.

(c) Have TEMPEST trained personnel onboard to perform as a Field TEMPEST Authority.

(d) Have COMSEC trained personnel onboard to assist field units and perform COMSEC equipment installations.

(e) Review all Time Compliance Technical Orders (TCTOs) for TEMPEST implications that would affect TEMPEST compliance.

(f) Assign a TEMPEST Control Officer with responsibility for the ARSC TEMPEST program and to assist field units in complying with TEMPEST requirements.

NOTE

Refer to COMDTINST M10550.25, chapter 23, for definitions.

c. Coast Guard Aviation TEMPEST Certification.

(1) Purpose. The purpose of certifying aircraft equipped with COMSEC is to ensure that the system, as installed on a particular aircraft tail number, complies with the system security requirements as specified in the design. Certification validates that the aircraft wiring, equipment installation, bonding, and wire shielding have been installed in strict conformance to the aircraft design documents or to applicable TCTOs and indicates that the installation inspection and operational test of the system(s) has been satisfactorily completed.

(2) Certification vs. TEMPEST Testing. Certification procedures do not include TEMPEST testing, but rely on the TEMPEST testing performed on a prototype installation. This ensures that the COMSEC features designed into the system have been preserved in the aircraft application. The certification procedure relies on the fact that subsequent systems are installed in strict compliance with specific TCTOs. These TCTOs, when followed, duplicate the design requirements that were verified on the TEMPEST surveyed aircraft. TEMPEST testing policy is addressed in paragraph 1.M.3.e.

(3) Policy. Certification is required for each new or modified airborne COMSEC installation. This includes the initial installation, reinstallation after modification of COMSEC equipment, or after modification of associated COMSEC aircraft wiring. Wiring modifications include, but are not limited to, rerouting of COMSEC equipment wires or other adjacent wiring. Contact the CG ARSC FTA for

further guidance. In addition, aircraft COMSEC installations shall be recertified during the aircraft PDM cycle. Certification is accomplished in accordance with this section.

(4) Procedures. The certification procedures for COMSEC systems include an installation inspection, an operational test, and aircraft logbook entry.

(a) Inspection. The installation inspection includes continuity checks of all cables and wiring harnesses associated with the COMSEC equipment and is performed to verify that the wiring complies with the aircraft design documents or applicable TCTOs.

(b) Operational Test. The operational test is performed to verify that the COMSEC system performs all of its functions satisfactorily. This part of the certification requires that each function of the COMSEC system operates in accordance with the operational specifications. Coordination is required between an auxiliary station and the test aircraft during the performance of certain operational test portions of the certification procedures. Personnel from the auxiliary station and the test aircraft should review the operational test procedures before the test to discuss the coordination requirements and to develop a frequency plan that identifies primary and backup frequencies that will be used to perform the tests. Operators should be familiar with restrictions concerning frequency management and the discussion of classified information on uncovered circuits.

(c) Logbook Entry. The aircraft logbook entry provides a permanent record that the COMSEC system has been certified.

(5) Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) Testing.

(a) Testing. Electromagnetic Interference/ Electromagnetic Compatibility testing shall be conducted prior to the installation or operation of electronic devices on board a Coast Guard aircraft. Contact ARSC Avionics Projects Branch to coordinate testing of any proposed electronic equipment. Installation of prototypes requires completion of EMI/EMC testing and feasibility approval from the ACCB (in accordance with paragraph 1.M.3.).

(6) Problems. Failure of any portion of the Installation Inspection or the operational test is a failure of the respective aircraft COMSEC system to pass certification.

(a) Installation Inspection. If the installation inspection is not satisfactory, DO NOT proceed with the operational test. Fault-isolate and repair as necessary.

(b) Operational Test. Upon successful completion of the Installation Inspection, continue with the operational test. If an equipment failure is encountered or suspected at any time during the Operational Test, DO NOT continue. Turn the system off, fault-isolate, and repair before proceeding.

(c) Incomplete Certification. If the operational test is not performed immediately following the Installation Inspection, COMSEC equipment will be removed from the aircraft, loose connectors secured, and applicable circuit breakers tagged until the certification procedure can be completed.

(7) Personnel Qualifications.

(a) Installation Inspection. Two people are required to perform the Installation Inspection, at least one of whom must have attended the limited maintenance training course for the COMSEC equipment being certified.

In addition, one must have had informal TEMPEST certification training at NATC Patuxent River and received official notice from Commandant (G-SEA) that he is certified as an FTA. Both must be familiar with approved techniques for the splicing, bonding, grounding, and shielding of aircraft wiring, and with the specific system installation being certified.

(b) Operational Test. The operational test requires two people. One shall have attended the Limited Maintenance COMSEC training for the equipment and system being certified. One shall be an aircraft technician familiar with the aircraft and qualified to operate aircraft systems. A single person may satisfy both of these requirements; however, a minimum of two people is required.

N. WEIGHING OF AIRCRAFT.

1. General. USAF Technical Order 1-1B-40 and 1-1B-50 outline the specific weight and balance requirements for USAF aircraft. These requirements, as modified below, will be used as a guideline to define weight and balance criteria for USCG aircraft.

2. Requirements. Reporting custodians shall ensure that USCG aircraft are weighed and the balance computed in accordance with the following criteria:

   a. At initial delivery.

   b. During programmed depot maintenance.

   c. When major modifications or repairs are made that will affect the weight and balance of the aircraft.

CAUTION

THE REMOVAL OR ADDITION OF COMPONENTS WITHIN THE AIRCRAFT MAY SIGNIFICANTLY ALTER THE BASIC AIRCRAFT CENTER OF GRAVITY. THE UNIT WEIGHT AND BALANCE OFFICER WILL BE NOTIFIED OF ALL AIRCRAFT CONFIGURATION CHANGES SO THAT A REVISED WEIGHT AND BALANCE FORM F (DD FORM 365F) MAY BE COMPLETED PRIOR TO FLIGHT.

   d. When the calculated weight and balance data is suspected of being in significant error.

   e. When unsatisfactory flight characteristics are reported which cannot definitely be determined as improper loading or error in weight and balance data.

   f. Whenever specified by ACMS.

O. FUNCTIONAL CHECKS OF AERONAUTICAL EQUIPMENT.

1. General. A functional check is a check to determine if a system or component is correctly performing its intended function. The depth of maintenance performed on an aircraft prior to flight and its relevance towards flight safety determine the extent to which components are functionally checked prior to release for operations. Functional checks are divided into ground checks, flight verification checks, and test flights, and are defined as follows:

   a. Ground Checks. Visual inspection and functional checks performed on the ground utilizing auxiliary power units, ground power (electrical or hydraulic) units, ground test equipment, the aircraft engines, or rotor engagement to provide system power.

   b. Flight Verification Checks. Airborne functional checks, conducted during a scheduled operational or training mission, for components or systems whose failure would neither adversely affect flight safety nor seriously affect mission accomplishment.

c. Test Flights. Airborne functional checks to establish if an airframe or equipment, when subjected to design environment, is operating properly. Generally, areas checked on test flights are equipment or systems whose failure would adversely affect flight safety.

2. Requirements. Specific functional check requirements are delineated herein and are minimum standards. The prerogative for more stringent minimums is reserved for Commanding Officers as local conditions or events dictate. The following requirements shall be adhered to:

a. Ground Checks.

(1) General. The performance of all aeronautical equipment is normally ground checked after maintenance has been completed. Ground checks shall be performed in accordance with applicable maintenance procedure cards (MPCs), Technical Orders (T.O.s) or maintenance instructions, and as dictated by good judgment. Certain specific maintenance actions, such as the replacement of landing gear actuators, are clearly detailed in maintenance instructions. The required ground checks for system cycling and landing gear drop checking are included in those instructions. Other maintenance actions not specifically addressed by the applicable publications require application of sound engineering practice and enlightened supervision to ensure adequate ground checks.

Example: Maintenance on landing gear hydraulic lines or fittings where replacing a line or tightening loose fittings may only require a system pressure check; whereas, replacement of a selector valve would require aircraft jacking and a complete landing gear drop check. Adequate ground checks are essential to safe execution of flight verification checks and test flights.

Flight Controls. Disassembly or replacement of any portion of a flight control system:

Example: Elevators, rudders, ailerons, blade unfolding, trim tabs, rotor head and blades, tail rotor gearbox and blades, control cables, fairleads, pulleys, rods, servo system, etc., all require a ground check to ensure synchronization of pilot's and copilot's controls and the proper movement of the control surfaces. This ground check shall be performed by all of the following:

(a) The mechanic performing maintenance.

(b) A quality assurance inspector.

(c) The pilot designated to conduct the required test flight or flight verification check.

b. Maintenance Release. Any aircraft having undergone maintenance requiring a functional check or test flight must be maintenance released. Additionally, any aircraft suffering damage on the ground or in flight must be maintenance released before further flight is attempted. A maintenance release signifies that a responsible individual has determined the correct maintenance or inspection has been completed for the discrepancy or other requirement. He/she also signifies that adequate ground checks and maintenance documentation have been correctly performed.

NOTE

The Engineering Officer is authorized to maintenance release aircraft at his/her unit. Additional officers and petty officers qualified to sign a maintenance release shall be designated in writing. Enclosure (5) is a sample Aircraft Maintenance Release Authority letter. Variations may be utilized as appropriate.

c. Flight Verification Checks. Any component or system not specifically requiring a test flight may receive a flight verification check at the discretion of the Engineering Officer. Certain exceptions are allowed; see paragraph 1.O.2.d.(3).

d. Test Flights.

(1) Test Flight - Complete. Complete test flights shall be conducted in accordance with test flight procedures detailed in applicable maintenance procedure cards (MPCs) or technical manuals. A complete test flight is required:

(a) After extended aircraft storage.

(b) After completion of major structural rework, including PDM.

(c) As indicated by maintenance procedure cards or technical manuals.

(d) Prior to delivery of aircraft to a PDM facility (see paragraph 10.A.2.c.).

(2) Test Flight - Partial. Upon completion of critical maintenance, a partial test flight is required to functionally check those components or systems which may have been affected by the maintenance action. Partial test flights are required:

(a) As indicated by MPCs, maintenance instructions, or applicable T.O.s.

(b) Flight control disassembly or replacement of any portion of a flight control system (for example: elevators, rudders, ailerons, trim tabs, rotor head and blades, tail rotor gearbox and blades, control cables, bearings, fairleads, pulleys, rods, servo system, etc.).

(3) Test Flight - Exceptions.

(a) HH-65 main rotor blade fold/unfold requires only a ground check with rotor engagement.

(b) If HC-130 aircraft maintenance requiring a test flight is limited to no more than one power plant package, a flight verification may be conducted in lieu of a test flight at the discretion of the Commanding Officer. Restrictions in the Air Operations Manual, COMDTINST M3710.1 (series), apply.

(c) HU-25 aircraft ATF3 engine replacement (one or both), module replacement, and fuel or electrical systems maintenance do not require a test flight, provided appropriate ground checks have been completed and an acceleration time check is satisfactorily completed prior to, or in conjunction with, the first takeoff following maintenance.

NOTE

A test flight for flight control maintenance may be waived at the discretion of the Commanding Officer or his/her designated representative when all of the following conditions are met:

1. The flight control maintenance involves only the removal and reinstallation of common connecting hardware (nut, bolt, cotter key, etc.) without a resulting change in adjustment and/or alignment, and no other flight control maintenance has been performed.

2. The applicable maintenance procedure card does not require a test flight.

3. Ground checks are conducted IAW paragraph 1.O.1.a.

4. Documentation initiated and completed IAW Chapter 4.: Flight Safety Maintenance Document (CG-4377A), CG-4377 Part III, and/or CG-4377B entry.

e. Preflight Briefing. Pilots in command of flight verification checks and test flights shall be briefed on procedures and systems to be checked by a Maintenance Officer or Quality Assurance Inspector prior to aircraft departure. Additionally, a Quality Assurance Inspector should be assigned as a part of the flight crew when practical. The pilot in command signature on Form CG-4377A, Flight Safety Maintenance Document, certifies completion of this briefing.

f. Records.

(1) Maintenance Flight Safety Warning. A Maintenance Flight Safety Warning Tag shall be attached to the pilot's yoke or cyclic stick whenever safety of flight maintenance requiring a ground check or airborne functional check has been performed. This tag shall be locally manufactured for reuse and state "CAUTION PILOTS AND AIRCREW. SAFETY OF FLIGHT MAINTENANCE HAS BEEN PERFORMED ON THIS AIRCRAFT. CHECK THE AIRCRAFT MAINTENANCE RECORD PRIOR TO FLIGHT."

(2) Form CG-4377A, Flight Safety Maintenance Document. The Flight Safety Maintenance Document is retained with the CG-4377 Part III in the Aircraft Maintenance Record. It is used for all maintenance performed that requires a functional check. It provides for the type of check required and appropriate sign off blocks for maintenance accomplishment, required ground checks, quality assurance inspection, maintenance release, pilot-in-command acceptance, and final completion of functional check. An aircraft requiring a test flight as the final maintenance action shall remain in an NMCM status, except while airborne, for the test flight items. Once all test flight items have been satisfactorily completed, signed off, and the aircraft pre flighted, the aircraft can then be returned to a Bravo status. Form CG-4377A is stocked at the Coast Guard Engineering Logistics Center, stock number 7530-01-GF3-0970.

P. COMMANDANT'S AERONAUTICAL ENGINEERING LOGISTICS COMPLIANCE INSPECTION (LCI). Visits to aviation units by personnel assigned to Commandant (G-SEA) and Commanding Officer ARSC will be conducted on a scheduled basis. The LCI team will focus on unit's adherence to aviation supply process procedures. Every aspect from ordering to disposition of parts will be scrutinized by ARSC supply personnel. The primary purpose of these visits is to ensure a direct ow of communication between the unit and the aeronautical engineering support structure. COMMUNICATION is the key word. Both the aeronautical engineering support personnel and the unit aviation engineering staff must receive and transmit meaningful information. During the course of the visit, the representatives from Commandant (G-SEA) and ARSC will closely scrutinize the quality of our joint product, i.e., the condition and configuration of assigned aircraft. Additionally, maintenance support systems will also be reviewed to ensure that required standards are adhered to and, perhaps more importantly, to take unit ideas and management successes for eetwide improvement. In order to properly prepare for this visit, a LCI Worksheet has been provided as Enclosure (2). An internal review of this checklist at the unit level upon relief of Engineering Officers and on a semiannual basis is encouraged.

Q. RELIABILITY CENTERED MAINTENANCE (RCM) PROGRAM. Reliability Centered Maintenance (RCM) is a logical discipline for the management and analysis of scheduled maintenance programs. The goal of the program is to realize the inherent reliability capabilities of the equipment being maintained. Commandant (G-SEA) manages the RCM program.

CHAPTER 2. ORGANIZATION

A. GENERAL. The Coast Guard Organization Manual, COMDTINST M5400 (series), provides detailed information regarding organizational characteristics and principles of various elements of the USCG. Engineering Officers should develop a working knowledge of these principles and ensure they are followed at the unit level. Organizational information provided in this chapter enables personnel to understand the interrelationships of the various elements of the organization pertaining to management of aeronautical maintenance.

B. OFFICE OF AERONAUTICAL ENGINEERING, COMMANDANT (G-SEA). Under the direction and general supervision of the Director of Engineering, Commandant (G-SE), the Chief, Office of Aeronautical Engineering shall:

1. Coordinate and supervise military and civilian personnel management responsibilities to ensure that necessary actions required by personnel management procedures are accomplished.

2. Participate with Office of Contract Support, Commandant (G-ACS), in the negotiation of contracts for the installation, repair, maintenance, and alteration of aircraft, engines, and related equipment; make final determinations as to acceptance terms and conditions included in such contracts insofar as dates of delivery, plans, specifications, and characteristics of the items desired are concerned.

3. Transmit requests for procurement to Commandant (G-ACS) accompanied, when appropriate, by detailed plans, specifications, etc.

4. Monitor contract performance insofar as inspections, tests, and technical judgments are necessary or desirable to assure compliance; assist in expediting contracts as required.

5. Ensure acquisition technical data packages meet Continuous Acquisition and Life-cycle Support (CALS) standards.

6. Furnish progress, scheduling and materiel requirement information concerning the installation, repair, maintenance, and alteration of aircraft, engines, and related equipment.

7. Prepare preliminary budget estimates, make allotment recommendations, administer funds allocated to the office, and pass on obligations for items to be charged against field allotments in those instances where prior Headquarters authorization is required.

8. Review Boards of Survey for aeronautical materiel.

9. Initiate requests for research and development (R&D) special studies, analyses, and projects which involve new aeronautical concepts, systems, and hardware for the Coast Guard inventory. Work closely with R&D staff in such development efforts.

10. Prepare technical proposals in response to tentative operational requirements.

11. Monitor and coordinate personnel actions concerning the training and assignment of officers to aeronautical engineering duty. Participate as a voting member of selection boards for aircraft maintenance officer and aeronautical engineering post graduate training programs. Coordinate activities of Duty Under Instruction Students (DUINS) at post graduate school for Commandant (G-SEA) sponsored programs.

12. Manage all Coast Guard aviation maintenance programs including, but not limited to: avionics, ground support equipment, rescue and survival equipment, computerized aircraft maintenance, and aviation maintenance information system.

13. Assist operational commanders in maintaining aviation unit facilities and support spares to adequately repair, maintain, outfit, and alter aircraft, engines, and related equipment. 14. Schedule visits to aviation units by members of Commandant (G-SEA) and ARSC to assess quality and adequacy of Coast Guard aviation support.

15. Coordinate Commandant (G-SEA) tasks assigned to the Aircraft Repair and Supply Center (ARSC). Function as the central contact and approving authority for work desired by other elements and for all matters which affect ARSC's ability to perform its primary mission.

16. Serve as Program Office for ARSC.

17. Coordinate Commandant (G-SEA) tasks assigned to the Aircraft Program Offices (APOs). Function as the central contact and approving authority for work desired by other elements and for all matters which affect the APOs ability to perform their primary mission.

18. Provide input to Planning Proposal Review Boards (PPRBs) involving aeronautical engineering matters.

19. Identify outside resources (8a contractors, etc.) to provide management studies, personnel studies, logistic studies, and automated data processing (ADP) studies in support of Commandant (G-SEA) programs.

20. Select and direct aviation maintenance officers, technical specialists, and ARSC personnel to participate as members of aviation Mishap Analysis Boards (MABs).

21. Review aviation mishap board reports. Serve as voting member on the Commandant's Aviation Safety Board.

22. Initiate and approve Maintenance Management Reviews (MMRs). Assign action items and approve plan of action.

23. Coordinate Commandant (G-SEA) responses to questions and answers from Congress, Office of Management and Budget (OMB), Office of the Secretary of Transportation (OST), Commandant (G-CCS) elements, and outside news media.

24. Coordinate with Office of Force Management, Commandant (G-SRF), concerning technical knowledge and maintenance responsibilities for the Aviation Maintenance Technician (AMT), Aviation Survival Technician (AST), and Avionics Technician (AVT) ratings. Review the recommendations of the Aviation Technical Training Advisory Committee (ATTAC).

C. PROGRAM MANAGER, COMMANDANT (G-SEA-A). Under the direction and supervision of the Chief, Office of Aeronautical Engineering, the Program Manager shall:

1. Fulfill the duties of Office Chief in his absence. Logistics Center, stock number 7530-01-GF3-0970.

2. Assist the Chief, Office of Aeronautical Engineering in the administration and oversight of the Aeronautical Engineering program.

3. Supervise the civilian Administrative Assistant.

4. Act as Senior Member of the Aviation Maintenance Office Selection Panel and the Aviation Maintenance Post Graduate Selection Panel.

5. Manage the day to day office function within Commandant (G-SEA), including the review of all correspondence for the Office Chief's signature, AFC30 and AFC41 budget management, leave and liberty management, and development of Office policy and procedures.

6. Serve as Senior Member of the joint Commandant (G-SEA) and ARSC Budget Control/ Planned Obligation Project (POP) Board.

D. AERONAUTICAL PROGRAMS DIVISION, COMMANDANT (G-SEA-1). Under the direction and supervision of the Chief, Office of Aeronautical Engineering, the Chief, Aeronautical Programs Division shall:

1. Manage the aircraft, life support equipment, and avionics maintenance programs for assigned aircraft. Management of these programs includes, but is not limited to:

   a. Programmed Depot Maintenance (PDM) programs.

   b. Aircraft configuration control.

c. Initiating and reviewing technical directives.

d. Developing policies to improve maintenance effectiveness and aircraft reliability.

e. Monitoring aircraft computerized maintenance programs.

2. Monitor the logistical support of assigned aircraft and installed avionics systems.

a. Provide technical guidance in the procurement and maintenance of replacement items, spare parts, and special equipment.

b. Coordinate the policy and planning functions related to the installation, maintenance, and support of all airborne electrical and electronic systems, their attendant ground support, and special test equipment.

3. Develop cost estimates, price determinations, and specifications for procurement, modification, programmed depot maintenance (PDM), and support of assigned aircraft and aircraft being considered for inclusion in the Coast Guard inventory.

4. Provide, or coordinate, assistance to Coast Guard and DOD elements on matters relating to the development of technical studies, engineering analyses, maintenance, alterations, repair, and other special projects related to assigned aircraft.

5. Monitor the activities of the Prime Units and ARSC regarding Headquarters assigned projects.

6. Provide Coast Guard representation on various technical committees.

7. Monitor technical progress in the field of aeronautical engineering.

a. Remain abreast of new developments for possible application to Coast Guard aviation programs.

b. Plan for the development and procurement of equipment to meet future aeronautical systems requirements.

8. Serve as technical subject matter specialist for assigned aircraft and provide inputs to Commandant (G-OCA), Commandant (G-S) and Commandant (G-SEA) as required.

9. Provide technical input in the review of preliminary or detailed plans for construction or alteration of facilities for assigned aircraft.

10. Coordinate technical programs at ARSC, Aviation Technical Training Center (ATTC), and other Coast Guard elements including, but not limited to:

a. Maintain liaison with ATTC concerning courses.

b. Act as subject matter specialist for all aircraft related matters including training, course curriculum content, and enlisted rating qualifications for the AMT and AVT rates. Coordinate with the Commandant (G-SRF), ATTC, and Prime Units.

c. Oversee the Coast Guard aviation TEMPEST program. Ensure the program remains consistent with National, DOT, and Commandant G-S policy. Monitor aviation compliance.

11. Provide liaison with other military and non-DOD users of similar type aircraft, engines, avionics, and special equipment. Administer the Navy-Type-Navy-Owned (NTNO) avionics equipment program.

12. Maintain liaison with the U.S. Air Force at Warner Robins USAF Base via the CG Liaison Officer. The CG Liaison Officer shall:

a. Advise appropriate staff components within USCG Headquarters of all aeronautical engineering matters under development by the U.S. Air Force which may be of interest or value to the USCG.

b. Monitor USAF procurement contracts involving USCG aircraft or related components; act as agent for the Commandant in all engineering and technical matters where USCG/USAF aeronautical engineering coordination is required.

c. Perform special services as required, due to the advantageous location of the Liaison Section at Warner Robins AFB.

d. Furnish assistance and guidance to USCG units and personnel, on request, whenever USAF coordination at Warner Robins AFB is required. Includes acting as liaison to Davis-Monthan AFB for policy and requirements in relation to aircraft in storage at Davis-Monthan AFB.

13. Provide assistance to aviation units on matters relating to aircraft salvage.

14. Commandant (G-SEA) and Commandant (G-SEN) share funding of the DOD Joint Oil Analysis Program (JOAP).

15. Manage the Reliability Centered Maintenance (RCM) Program.

E. AERONAUTICAL PROJECT MANAGEMENT DIVISION, COMMANDANT (G-SEA-2). Under the direction and supervision of the Chief, Aeronautical Engineering Division, the Chief, Aeronautical Project Management Division shall:

1. Develop specifications for new equipment to satisfy operational requirements.

2. Supervise the design, procurement, and installation phases of assigned acquisition projects including attendant ground support and special test equipment.

3. Assist the Office of Acquisition in major procurement programs for assigned aircraft, engines, avionics, and special equipment.

4. Review Commandant G-SEA project implementation plans to ensure adequate resources will be available to support all maintenance and logistics aspects before proceeding from the development/ procurement phase to the production/operational phase.

5. Manage acquisition projects using assigned project managers. The project manager shall:

a. Ensure that projects are managed in compliance with DOT and USCG directives, guidance from higher authority, and sound business practices.

b. Manage all aspects of each project to meet approved cost, schedule, performance, and support goals.

c. Act as Contracting Officer's Technical Representative (COTR) to ensure that the provisions of assigned contracts are carried out. Manage contractor support as required.

d. Act as the central focal point for information within the Coast Guard for the project assigned. Answer inquiries from higher authority and provide project liaison with ARSC, DOD, DOT, and other Coast Guard segments.

e. Develop and coordinate project planning and execution documents such as Project Master Plan (PMP) in accordance with standard guidance.

f. Develop and maintain a project implementation plan which defines how responsibility for acquired systems, including their associated logistic support, will be transferred from the development/installation stage to the operational stage.

g. Coordinate RCP preparation with Commandant (G-SEA). Act as project fund manager and approval authority for execution of funds appropriated for the project as directed by Commandant (G-SEA). Coordinate solicitation or reprogramming action, as required to meet changes in requirements, with Commandant (G-SEA).

6. Manage Aviation Logistics Information Technology Strategic Planning.

a. Provide liaison with Commandant (G-SRP) and Commandant (G-SIA) in Information Technology areas of value to Aeronautical Engineering. Provide information conduit and requirements monitoring of ARSC Information Technology issues. Provide guidance in the development of the Coast Guard corporate information system.

b. Provide oversight of acquisition, development and funding of Coast Guard Aviation Logistics Information Systems. Ensure requisite policies and reporting requirements are followed.

c. Provide liaison with other Coast Guard Headquarters' program entities responsible for developing systems whose requirements potentially impinge on Coast Guard Aviation Logistics Systems. Identify and support requirements to ensure Coast Guard Aviation Logistics Mission Essential Activities are maintained or enhanced.

F. AIRCRAFT REPAIR AND SUPPLY CENTER (ARSC), ELIZABETH CITY, N.C. ARSC's missions are to (1) provide depot level maintenance, overhaul, major repair, and modification of aircraft and aeronautical equipment; (2) provide for procurement, storage, stocking of inventory, control, accounting, issue, and shipping of supply parts, and aeronautical equipment; (3) preserve, store, and maintain replacement aircraft and parts; (4) provide technical engineering support in aeronautical and avionics fields; (5) provide salvage advisory expertise when required; and (6) evaluate future needs and provide information for resource change proposals (RCPs).

1. Aviation Repair Division. The Aviation Repair Division has the primary responsibility of managing the programmed depot maintenance (PDM) program for HU25A/B/C, HH60J, and HH65A aircraft as well as the major repair and depot-level modification of these aircraft. In addition, the Aviation Repair Division provides an extensive scope of aviation component repair, refurbishment, modification, and overhaul in support of requirements for the ARSC Aviation Supply and Engineering Divisions, the field units, the PDM lines, and several DOD facilities. The management and oversight tasks of all Coast Guard Contractor Field Team (CFT) projects, along with the direct support of all requests by field units and the ARSC Aviation Engineering Division for technical assistance, through the provision of labor, parts, tooling, special equipment, training, and expertise, are functions of the Aviation Repair Division. Requirements for aircraft drop-in maintenance (in need of unique depot-level resources), crash damage repair evolutions, special airframe systems change project lines, and ARSC Aviation Engineering requests for prototype installations and procedural proof-testing, are also managed by the Aviation Repair Division, in addition to the collateral duties as the ARSC Operations Department. The mission of the Aviation Repair Division - to safely provide the highest quality products and services to meet the needs of theitimely and cost effective manner - is carried out through the personnel actBranches (Overhaul, Fixed Wing Maintenance, Rotary Wing MaintenanceSupport). The Aviation Repair Division will adhere to the same guidelines as the rest ofCoast Guard aviation as prescribed in this manual.

2. Aviation Engineering Division. The Aviation Engineering Division is responsible for providing technical information and data to other ARSC divisions, Headquarters, and operating units. Various proposed components and systems are refined, prototyped, tested, and installed. The division manages aeronautical engineering technical publications, aviation life support equipment, avionics projects, the reliability centered maintenance program, the joint oil analysis program, the corrosion control program, the spare parts breakout program, the Flight Safety Critical Aircraft Parts (FSCAP) program, and ARSC's Quality Assurance program. The division also coordinates the administration of all aircraft maintenance industrial systems that are common to both fixed and rotary wing aircraft including but not limited to, pollution prevention, hazardous materials management, accident prevention, and industrial applications.

3. Aviation Supply Division. The Supply Division performs the following functions: Principal fiscal and supply advisor for the command; budgets and accounts for all funds transferred to ARSC; Aviation Inventory Control Point (AICP) for USCG aviation materiel; stocks and distributes aviation materiel to users; develops and maintains aviation unit Allowance Lists; administers warranties and contractor maintenance programs for Coast Guard aeronautical

materiel; administers the Aviation Maintenance Management Information System (AMMIS); provides routine dispersion services and coordinates the civilian payroll at ARSC.

4. Management Information Service Division (MISD). The MISD is tasked with the responsibility to provide information storage, retrieval, and other services normally associated with an automatic data processing (ADP) system. This responsibility includes financial analyses, inventory control models, production scheduling models, man-hour accounting information, and ADP support for AMMIS. Coordinating these programs to achieve maximum effective utilization from the available ADP equipment is a primary function.

5. Administrative Division. The Administrative Division responsibilities include administration of the military and civilian personnel program including performance evaluations, promotions, training, wage rate changes, hiring, and firing.

6. Product Line Manager.

   a. Purpose. The Product Line Manager (PLM) position was created at ARSC to optimize the technical and logistical support of Coast Guard aircraft product lines. The PLM directs and is responsible for support issues pertaining to their assigned aircraft type (HU25, HC130, HH65, HH60). For routine technical or support issues, it is expected that operational units utilize and work directly with ARSC Technical Services, Supply Division, and Repair Division as outlined in the current ARSC Customer Service Guide.

   b. Organization. The PLM reports directly to the Executive Officer of ARSC who serves as the Product Line Director (PLD). Under the direction and supervision of the Product Line Director, the PLM has the responsibility for planning, control, and execution of product line system support.

   c. Authority. The PLM has the necessary ARSC Division Chief authority to direct and smoothly coordinate cross-divisional (Engineering, Supply, Repair) and Aeronautical Engineering program issues relating to the PLM's specific aircraft product line and support system. The major portion or product line support work is accomplished by an Element Manager Team comprised of representatives from the various ARSC divisions (Engineering, Supply, and Repair). These Element Managers then make task commitments to the PLM in their particular area of responsibility to support the PLM/ product line agenda.

   d. Responsibilities.

      (1) PLMs shall monitor product line operating and support costs (both Operating Expenses (OE) and Acquisition, Construction and Improvement (AC&I)) to ensure best value to the Government and that sound business practices are balanced against operational requirements. The PLM actively participates in managing the annual budget process, contracting issues, and inventory management issues relating to specific product lines.

      (2) PLMs shall review supply usage data, Engineering Investigations, Discrepancy Inspection Reports, Unsatisfactory Reports, and other pertinent data (Aviation Computerized Maintenance System (ACMS) and Measures of Effectiveness (MOE)) in order to initiate action to improve reliability and maintainability for aircraft components that indicate high usage, require long lead time, or constitute high procurement costs.

      (3) PLMs will pursue other Government agencies, outside vendor, and contractor support to perform tasks outside the capabilities or scope of existing Coast Guard resources.

G. TYPICAL AVIATION UNIT. The Air Operations Manual, COMDTINST M3710.1 (series), provides detailed information regarding the standard organization for air units.

H. PRIME UNIT. The purpose of providing a designated "Prime Unit" is to ensure a centralized point for technical responsiveness to field level maintenance management of a specific aircraft type or

aviation life support equipment. The scope of the Prime Unit responsibilities extends beyond the aircraft to all of its related systems, subsystems, GSE, special tools, equipment, and shop practices. Prime Units receive their tasking from ARSC and function as the first point of contact on technical matters for all respective field activities as outlined in paragraph 2.H.1. and paragraph 2.H.2.

1. Designated Prime Units. The following units are designated Prime Units for the indicated aircraft and aviation life support equipment (ALSE):

Aircraft	Aviation Unit
ALSE	ATC Mobile
HU-25	ATC Mobile
HC-130	Elizabeth City
HH-60	Elizabeth City
HH-65	New Orleans

2. Functions and Responsibilities. The Prime Unit is responsible for providing a constant review of field level maintenance management practices. Specific functions of the Prime Unit are:

   a. Maintenance Procedure Cards (MPCs) and Maintenance Text Cards (MTCs). The Prime Unit develops, reviews, and updates MPCs and MTCs as necessary to ensure that all field level maintenance is accomplished with optimum efficiency. ARSC will provide technical review and final approval on all proposed MPC and MTC changes. The initiating unit will maintain a file of proposed changes and recommendations for 1 year.

   b. Manuals. Aircraft Prime Units continuously review their aircraft specific manuals listed in the Master Publications Index (MPI) and submit CG-22s to implement any proposed changes relating to field maintenance. The ALSE Prime Unit is responsible for the Aviation Life Support Systems Manual, COMDTINST M13520.1 (series). Prime Units are often requested to participate in prepublication reviews of new or revised manuals.

   c. Prototype and Verification of Changes and Technical Orders. When directed by ARSC, Prime Units make trial installation of changes prepared by ARSC or other activities to verify kit contents and installation instructions prior to distribution. Prime Units are often requested to prototype a change and prepare the TCTO. TCTOs are then forwarded to ARSC for review and final approval.

   d. Aircraft Records. Prime Unit will review the standardization of aircraft records and inventories, and submit proposed changes to ARSC.

   e. Unsatisfactory Reports (URs). Prime Units (for the affected aircraft/ALSE) shall be included as information addressees on all Urgent Interim URs. Prime Units will closely scrutinize all Urgent Interim URs and make comments or recommendations to ARSC. When requested, Prime Units will support ARSC with the evaluation of routine URs.

   f. Conferences and Meetings. Prime Units may be invited to send representatives to attend selected technical meetings which involve ALSE or prime aircraft, its engine or avionics.

   g. Technical Training Courses. Prime Units will assist in the development and review of technical courses of instruction at ATTC and commercially developed schools. They will occasionally be directed to attend selected courses and provide written feedback on their relevance to Coast Guard maintenance requirements.

   h. Aircraft Configuration Control Board (ACCB). Prime Units may be tasked with reviewing a proposed aircraft configuration change and/or providing a recommendation for location and installation of new equipment.

i. General Shop Practices. The Prime Unit will review all tools required to maintain the prime aircraft/ALSE, including tools that are not listed as 'special tools' but facilitate maintenance. They will examine the requirements for, and suitability of, all available maintenance stands, protective covers and devices, and commercially developed standard practices.

CHAPTER 3. CLASSIFICATION OF AVIATION MAINTENANCE ACTIVITIES

A. GENERAL. Each aviation field unit has a prescribed minimum level of maintenance capability. Enclosure (1) provides a listing of the specific functions required to attain these levels or classification. The classifications permit a cost versus benefit comparison in determining allocation of personnel, materiel and funds. This standard provides units, districts, and Maintenance Logistic Commands (MLCs) with an effective tool for evaluating the following items:

1. Requests for changes in allowance list.

2. Requests for new/replacement equipment.

3. Requirements for additional aircraft maintenance funds.

NOTE

The prescribed levels or classifications are minimum objectives for staff support as well as unit attainment. The levels prescribed are "minimum required" and as such are not intended to restrict initiative or expansion of capability when economical and practical. The abilities of personnel assigned, local operating conditions, efficiency of operations, and cost are unique to each unit; therefore, individual capabilities should be considered in that context.

B. CLASSIFICATIONS. Each aviation unit has two classifications:

1. The first classification describes the required level of maintenance utilizing local military and commercial facilities to the fullest extent practical. The distance/time elements of the word "local" are left to the Commanding Officer of each unit and dependent on the following:

   a. Urgency of need.

   b. Frequency of need.

   c. Transportation availability.

   d. Inherent delays in obtaining the services or use of the facility versus time available.

NOTE

Major changes in the availability of these facilities and services to the unit may necessitate changes in the on-board equipment or funds needed to maintain the required level of capability.

2. The second classification is the minimum in-house or on-board capability required. This capability shall be maintained regardless of availability of local facilities and represents the minimum readiness posture of the unit from the aircraft maintenance standpoint. Note that these classifications are interdependent with type of aircraft and support equipment assigned. Consequently, major changes in aircraft or support equipment assigned may also necessitate changes in on-board equipment or funds to maintain the required capability.

C. TYPES OF CLASSIFICATIONS. The classifications assigned to the USCG aviation unit levels of maintenance are defined as follows:

1. Class D (Shop Maintenance). Class D-level maintenance is also a part of the DOD "Intermediate Maintenance." The work performed consists of the routine day-to-day upkeep required by shop facilities. This includes minor repair, check, test, and adjustment of aeronautical items that have been removed and which are normally to be reinstalled after completion of such work. Shop maintenance includes preservation, inspection, examination, specified bench test, correction of discrepancies, adjustment, minor repair and/or replacement, and emergency manufacture of parts, all of which require only portable hand or machine tools, semiportable or bench mounted equipment.

2. Class C (Component Repairs). Class C-level maintenance is also categorized under the DOD "Intermediate Maintenance" and is devoted to the repair (not overhaul), test, and return to serviceable status of unserviceable aeronautical components and equipment. Items repaired by C-level maintenance are removed from locally operating aircraft or equipment and, due to the nature of the discrepancies involved, are usually replaced by serviceable items drawn from stock. Component repair maintenance involves preservation, inspection, examination, specified bench test, correction of discrepancies, calibration, repair and/or replacement, and emergency manufacture of parts requiring light installed equipment. Class C-level maintenance also includes all the requirements of lower, Class D-level maintenance.

D. UNIT REQUIREMENTS.

1. Table 3-1. shows the minimum maintenance capability required of each aviation unit. All USCG aviation units are expected to perform their own periodic inspections and minor repair. Commanding Officers of aviation units shall ensure that at least the specified capability is maintained. The Commandant (G-SEA), MLCs and District Commanders should provide equipment and funds sufficient to support the assigned level of maintenance, and they will balance requests for additional equipment or funds against other parameters such as economics, local conditions, and district or area operational requirements.

2. All unit avionics shops are required to maintain an in-house capability for avionics repair at the Class C-level. Aircraft type avionics system Integrated Logistics Support Plans (ILSPs) or maintenance manuals will provide specific guidance on the level of repair authorized at the unit for a given avionics system.

Table 3-1. Maintenance Level Classification

Area, District, Unit	Utilizing Local Facilities		In-House Capability	
	Class Level	Exceptions	Class Level	Exceptions
1st District				
Brooklyn	C		D	Note 1
Cape Cod	C		D	Note 1
Atlantic Area				Note 2
Clearwater	C		D	Note 1
Elizabeth City	C		D	Note 1
5th District				
Cape May	D		D	
Elizabeth City	C		D	Note 1
7th District				
Borinquen	D		D	
Clearwater	C		D	Note 1
Miami	C		D	Note 1
Savannah	C		D	
8th District				
Corpus Christi	C		D	

Area, District, Unit	Utilizing Local Facilities		In-House Capability	
	Class Level	Exceptions	Class Level	Exceptions
Houston	C		D	
Mobile	C		D	Note 1
New Orleans	C		D	
9th District				
Detroit	C		D	
Traverse City	C		D	
11th District				
Humboldt Bay	C		D	
Los Angeles	C		D	
San Diego	C		D	
San Francisco	C		D	
Sacramento	C		D	Note 1
Pacific Area				Note 2
Barbers Point	C		D	Note 1
Kodiak	C		D	Note 1
13th District				
Astoria	D		D	
North Bend	D		D	
Port Angeles	D		D	
14th District				
Barbers Point	C		D	Note 1
17th District				
Kodiak	C		D	Note 1
Sitka	D		D	
Headquarters				
Washington	C		D	

Note 1: Exceptions

Items of Exception	Minimum Level Required of Excepted Items
Cable, tube and rod work (Controls)	C
Soldering	C
Paint	C
Hydraulic/pneumatic component maintenance	C

Note 2: Area Commands control HC-130 operations, except CGAS Sacramento.

CHAPTER 4. AIRCRAFT AND AERONAUTICAL RECORDS AND REPORTS

A. AIRCRAFT LOGBOOKS (RECORDS).

1. General. All activities having custody of USCG aircraft shall maintain aircraft logbooks and associated records for assigned aircraft and components in a proper and up-to-date status. Aircraft logbooks are an essential element of aeronautical technical discipline. They provide a history of maintenance, operation, and configuration control of the aircraft.

   a. Standardization of Records and Reports. USCG aircraft maintenance documentation is a compilation of Air Force, Navy, commercial, and Coast Guard developed procedures. This chapter provides specific guidance in the use of Coast Guard aircraft logs, records, and reports.

NOTE

The Engineering Officer or a designated representative shall conduct a monthly review of each aircraft logbook as a quality assurance check of Aviation Computerized Maintenance System (ACMS) management procedures. Particular attention should be directed to the airframe configuration report to verify that each installed component has a serial number displayed. The person conducting the review shall sign and date the front of the logbook to document compliance.

   b. Required Logbook Forms and Format. The following forms are required, as ordered below, in each logbook for HH-65, HU-25, HH-60, and HC-130 aircraft:

FORM	TITLE
AFTO 290	Aerospace Vehicle Delivery Receipt
*OPNAV 4790/110	Aircraft Inventory Record
*OPNAV 4790/111	Aircraft Inventory Record Equipment List
*OPNAV 4790/112	Aircraft Inventory Record Shortages
*OPNAV 4790/104	Aircraft Inventory Record Certification and Record of Transfers
AFTO 781J	Airframe and Engine Operating Time and Cycle Information
TO 1-1B-40	Weight and Balance Data
Config	ACMS Configuration Report
AFTO 103	Aircraft Missile Condition Report

*(See Enclosure (6) for sample forms.)

NOTE

HC-130 aircraft utilize MPC 000.7 in place of OPNAV 4790.

NOTE

AFTO 103 is applicable to HC-130 aircraft only.

2. Specific Information.

a. All dates recorded on forms will be recorded by month, day, and year. Two numbers for month, two numbers for day, and two numbers for year. Example: 04/30/93.

b. Accumulation of flight hours on the CG-4377 Part III shall be recorded to the nearest tenth of an hour. Entries on all other forms and records listed herein will be rounded to the nearest whole hour.

c. AFTO 781J. The following information shall be entered on the AFTO 781J (manual entry or computer spreadsheet) for each aircraft type and maintained for 1 year:

(1) HC-130: Aircraft flight hours.

(2) HU-25: Aircraft flight hours, landings, engine (airframe) cycles number 1 and 2.

(3) HH-65: Aircraft flight hours, landings, engine starts (idle position) number 1 and 2, engine starts (flight position) number 1 and 2, airframe cycles Ng (gas generator turbines) number 1 and 2, airframe cycles Np (engine power turbine speed) number 1 and 2, Zone B and C number 1 and 2.

(4) HH-60: Aircraft flight hours, low cycle fatigue (LCF) 1, LCF 2, engine operating hours (EOH), time-temperature index indicator (TTI).

d. Engine Cycle Tracking. Many engine components require cycle tracking. These components are identified in ACMS. Record engine cycle data as follows:

(1) ATF3. Engine cycle data shall be recorded on form CG-4377 Part III and/or CG-4377B. An engine cycle is defined as follows: engine start; power lever advanced to 80% N1 or above, engine shutdown. All three events must occur to obtain one cycle. Advances of the power lever above 80% N1 more than once between engine start and engine shutdown does not add additional cycles.

(2) LTS-101. HH-65 airframe Ng and Np cycles are tracked to allow each engine's cycles to be captured in much the way operating hours of different components are tracked (i.e., airframe hours when installed, subtracted from airframe hours when removed = component operating hours); airframe Ng cycles are used for tracking time since new (TSN) and time since overhaul (TSO) cycles for Ng components, while airframe Np cycles are used for tracking TSN and TSO cycles for Np components. The total number of engine starts will be used to calculate airframe Ng cycles and the number of rotor engagements/Np cycles (through transient range of 79-86 percent Np) is used to calculate airframe Np cycles.

(a) Pilots will record number of landings (surface contact), number of engine starts, and number of rotor engagements/Np cycles (through 79-86 percent transient range) for each flight. Maintenance personnel will also record the total number of engine starts they perform. The number of engine starts will be recorded in engine start cycles blocks 1 and 2 (for No. 1 and No. 2 engines) on the CG-4377 Part III or CG-4377B. The number of rotor engagements/Np cycles through the transient range will be recorded in the engine start cycles blocks 3 (No. 1 engine) and 4 (No. 2 engine) on the CG-4377 Part III or CG-4377B.

(b) The Log Yeoman will record the data from CG-4377 Part III and CG-4377B on an HH-65 Operating Time and Cycles Documentation Sheet for each flight and calculate the Ng and Np cycles.

(c) Upon removal of a cycle tracked component from an aircraft, the Significant Component History Report (SCHR) shall be annotated with aircraft TSN and Ng/Np cycle count information.

Example: Component installed on acft No. 6500 at 459 acft hrs, acft Ng cycles - 50 acft Np cycles - 46. Component TSN - 60 hrs/TSO - 60 hrs, Ng cycles - 10, Np cycles - 7. Component removed from acft No. 6500 at 500 acft hrs, acft Ng cycles - 75, acft Np cycles - 68. Component TSN - 101 hrs/TSO - 101 hrs, Ng cycles - 35, Np cycles 29.

e. ACMS Configuration Report. This computer generated report lists all serial number tracked components on an aircraft or major assembly. The report also details the actual serial numbers of all installed components. A current copy of the configuration report must be contained in each aircraft logbook.

NOTE

The absence of a serial number entry against a particular component indicates the component is not installed in the data base and required maintenance is not being scheduled against it.

f. Maintenance Due List (MDL). As a minimum, units shall print a new MDL once a month for each aircraft assigned to the unit. The new MDL should project all scheduled maintenance for calendar and hourly tasks for a 2 month operating period. Once the new MDL is printed, the old MDL may be discarded.

g. Significant Component History Report (SCHR). This computer generated report maintains a record of significant maintenance actions on serial number tracked items. SCHRs are required to be maintained on all components listed on the aircraft configuration report. SCHR entries for removals, installations, Time Compliance Technical Order (TCTO) accomplishment, overhaul, and special inspections (i.e., overtorque, overspeed) are automatic (including TSN, TSO, and cycles since new (CSN) entries) when the associated Maintenance Procedure Card (MPC) is properly entered. Other required entries must be separately entered into the data base using the appropriate ACMS form, see CGTO PG-85-00-10. Required SCHR entries include, but are not limited to the following:

(1) ARSC Engineering Services Requests (ESRs) that generate a structural repair.

(2) Aircraft hours and brief description of any mishap or incident requiring depot level repairs.

(3) Brief description of airframe or component repair.

(4) ATF3 engine first, second, and fifth stage turbine nozzle effective ow areas (EFA) shall be entered on appropriate SCHR. Baseline nozzle EFAs established during each test cell run shall be recorded on the engine SCHR. The EFA of the installed first stage nozzle shall be entered on the high pressure turbine module SCHR. The EFA of the installed second and fifth stage nozzle shall be entered on the engine SCHR.

(5) HH-65 airframe transmission deck leveling plate corrections entered on the airframe SCHR.

(6) LTS-101 engine/acc gearbox torquemeter pressure reading from test cell run.

(7) The part number of the LTS-101 GP rotor assembly shall be appended to the part number of the GP (gas producer disk). Example 4-111-015-09-39.

(8) HH-65 and HH-60 main rotor blade trim tab settings.

(9) Date of manufacture of oat bags, fuel cells, and pressurized containers which have a shelf life.

(10) Any information required to be entered on a SCHR by an MPC, maintenance text card, technical order, or TCTO.

(11) LTS-101 GP nozzle EFA shall be entered on the GP module SCHR. Power turbine (PT) nozzle EFA shall be entered on the PT module SCHR.

(12) Dates of enrollment (inclusive) for all components enrolled in the Joint Oil Analysis Program, including location of lab.

(13) HU-25 dates of enrollment (inclusive) for all components enrolled in the Spectrometric Oil Analysis Program (SOAP).

(14) Date of suspension/resumption of an aircraft from active ACMS calendar tracking.

(15) HU-25 flight control rigging readings.

h. ACMS Maintenance Procedure Cards (MPC). An MPC shall be completed for any component with an existing removal/installation signoff card anytime such component is removed or installed.

i. Instructions for the Monthly Unit Operating Statistics (MORPT). (See Figure 4-1.)

(1) Record total hours available and total hours own during the month by this aircraft type rounded to the nearest whole hour.

(2) The MORPT entry may only be entered by the activity owning the aircraft when the month ended.

(3) Report the individual aircraft operating statistics recorded on this form and the unit operating statistics, if applicable, to ACMS not later than the seventh day following the end of the report period.

j. Uninstalled Serial Number Tracked (SNT) Components. All uninstalled serial number tracked (SNT) components must be accompanied by a current copy of the SCHR. Major assemblies, classified as Type 1, such as engines, rotor heads, etc., which have other SNT components installed must be accompanied by a current configuration report as well as all the applicable SCHRs.

NOTE

A current SCHR shall be reviewed prior to installation of any serial number tracked component. Additionally, prior to installation of any Type 1 assembly, it is recommended that both a current MDL and configuration report be reviewed. This procedure will preclude inadvertent installation of a component or assembly that has pending or overdue maintenance or that is actually unserviceable.

k. Unknown Data. Components with unknown or missing serial numbers, TSN, TSO, or CSN (if applicable) must not be installed until data is determined or assigned. This data can only be assigned by ARSC Engineering Division or Commandant (G-SEA). Units are NOT authorized to halflife components. Unknown part numbers should also be verified when possible.

l. Aircraft Statistics Report (ASR). The ASR became operational 1 July 1994 in response to suggestions made by the Aeronautical Engineering Measures of Effectiveness Quality Action Team. The ASR does not contain information earlier than 1 July 1994. Operating statistics earlier than 1 July 1994 may be obtained by contacting ACMS.
The ASR is used to capture aircraft/unit operating statistics. An ASR form shall be completed daily for each aircraft at a unit. (See Figure 4-2.)

U. S. COAST GUARD AVIATION COMPUTERIZED MAINTENANCE SYSTEM	HC-130 **MORPT** REV'D 08/25/97

OPERATING ACTIVITY	AIRCRAFT	INFORMATION ENTERED BELOW IS CURRENT AS OF 2400 ON THE LAST DAY OF THE MONTH OF _____ YEAR _____
	HC-130	

ITEM ☐ DUE	CMSCODE	ACTION	DESCRIPTION	CEINUM
	052000	REPORT	MONTHLY OPERATING STATISTICS - ALL UNITS	30-0000-01

AIRCRAFT NUMBER	CURRENT AIRCRAFT HOURS	REMARKS

NOTE

REFER TO COMDTINST M13020.1 (SERIES) FOR COMPLETION INSTRUCTIONS.

OPERATIONAL UNITS & ATC MOBILE ONLY

Record total hours flown during the month by this aircraft type rounded to the nearest WHOLE hour.

☐ TOTAL HOURS FLOWN

LOG YEOMAN	REVIEWED BY	DATA ENTRY COMPLETED

Page 1 of 1

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Figure 4-1. (Sheet 1 of 4)

Monthly Unit Operating Statistics (MORPT)

Figure 4-1. (Sheet 1 of 4)
Monthly Unit Operating Statistics (MORPT)

U. S. COAST GUARD
AVIATION COMPUTERIZED MAINTENANCE SYSTEM

HH-60
MORPT
REV'D 08/25/97

AIRCRAFT NUMBER	OPERATING ACTIVITY	MAINTENANCE ACCOMPLISHED A/C HOURS	INFORMATION ENTERED BELOW IS CURRENT AS OF 2400 ON THE LAST DAY OF THE MONTH OF _____ YEAR _____

ITEM DUE	CMSCODE	ACTION	DESCRIPTION	CEINUM
☐	052000	REPORT	MONTHLY OPERATING STATISTICS	60-0000-001

TECHNICIAN'S SIGNATURE _____ TECHNICIAN'S ID _____ **ALL UNITS**

ENGINE NUMBER 1 SERIAL NO. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

TAKE READINGS FROM HISTORY RECORDER			
LCF1	LCF2	TT1	EOH

ENGINE NUMBER 2 SERIAL NO. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

TAKE READINGS FROM HISTORY RECORDER			
LCF1	LCF2	TT1	EOH

NOTE

REFER TO COMDTINST M13020.1 (SERIES) FOR COMPLETION INSTRUCTIONS.

FORM_____ OF (_____)

(NUMBER OF AIRCRAFT REPORTED THIS MONTH)

OPERATIONAL UNITS & ATC MOBILE ONLY

Record total hours flown during the month by this aircraft type rounded to the nearest WHOLE hour.

☐ TOTAL HOURS FLOWN

LOG YEOMAN	REVIEWED BY	DATA ENTRY COMPLETED

Page 1 of 1

04001b

Figure 4-1. (Sheet 2 of 4)

Monthly Unit Operating Statistics (MORPT)

Figure 4-1. (Sheet 2 of 4)
Monthly Unit Operating Statistics (MORPT)

U. S. COAST GUARD AVIATION COMPUTERIZED MAINTENANCE SYSTEM	HH-65 **MORPT** REV'D 08/25/97

OPERATING ACTIVITY	AIRCRAFT	INFORMATION ENTERED BELOW IS CURRENT AS OF 2400 ON THE LAST DAY OF THE MONTH OF _____ YEAR _____
	HH-65A	

ITEM ☐ DUE	CMSCODE	ACTION	DESCRIPTION	CEINUM
	052000	REPORT	MONTHLY OPERATING STATISTICS - ALL UNITS	65-0000-001

AIRCRAFT NUMBER	CURRENT TOTAL AIRCRAFT HOURS	AIRCRAFT NG CYCLES NO. 1	AIRCRAFT NG CYCLES NO. 2	AIRCRAFT NP CYCLES NO. 1	AIRCRAFT NP CYCLES NO. 2	REMARKS

NOTE

REFER TO COMDTINST M13020.1 (SERIES) FOR COMPLETION INSTRUCTIONS.

OPERATIONAL UNITS & ATC MOBILE ONLY

Record total hours flown during the month by this aircraft type rounded to the nearest WHOLE hour.

☐ **TOTAL HOURS FLOWN**

LOG YEOMAN	REVIEWED BY	DATA ENTRY COMPLETED

Page 1 of 1

04001c

Figure 4-1. (Sheet 3 of 4)

Monthly Unit Operating Statistics (MORPT)

Figure 4-1. (Sheet 3 of 4)
Monthly Unit Operating Statistics (MORPT)

U. S. COAST GUARD
AVIATION COMPUTERIZED MAINTENANCE SYSTEM

HU-25
MORPT
REV'D 08/25/97

OPERATING ACTIVITY	AIRCRAFT	INFORMATION ENTERED BELOW IS CURRENT AS OF 2400 ON THE LAST DAY OF THE MONTH OF _____ YEAR _____
	HU25A	

ITEM ☐ DUE	CMSCODE	ACTION	DESCRIPTION	CEINUM
	052000	REPORT	MONTHLY OPERATING STATISTICS - ALL UNITS	25-0000-001

AIRCRAFT NUMBER	CURRENT TOTAL AIRCRAFT HOURS	TOTAL AIRCRAFT LANDINGS	TOTAL NO. 1 AIRFRAME CYCLES	TOTAL NO. 2 AIRFRAME CYCLES	REMARKS

NOTE

REFER TO COMDTINST M13020.1 (SERIES) FOR COMPLETION INSTRUCTIONS.

OPERATIONAL UNITS & ATC MOBILE ONLY

Record total hours flown during the month by this aircraft type rounded to the nearest WHOLE hour.

☐ TOTAL HOURS FLOWN

LOG YEOMAN	REVIEWED BY	DATA ENTRY COMPLETED

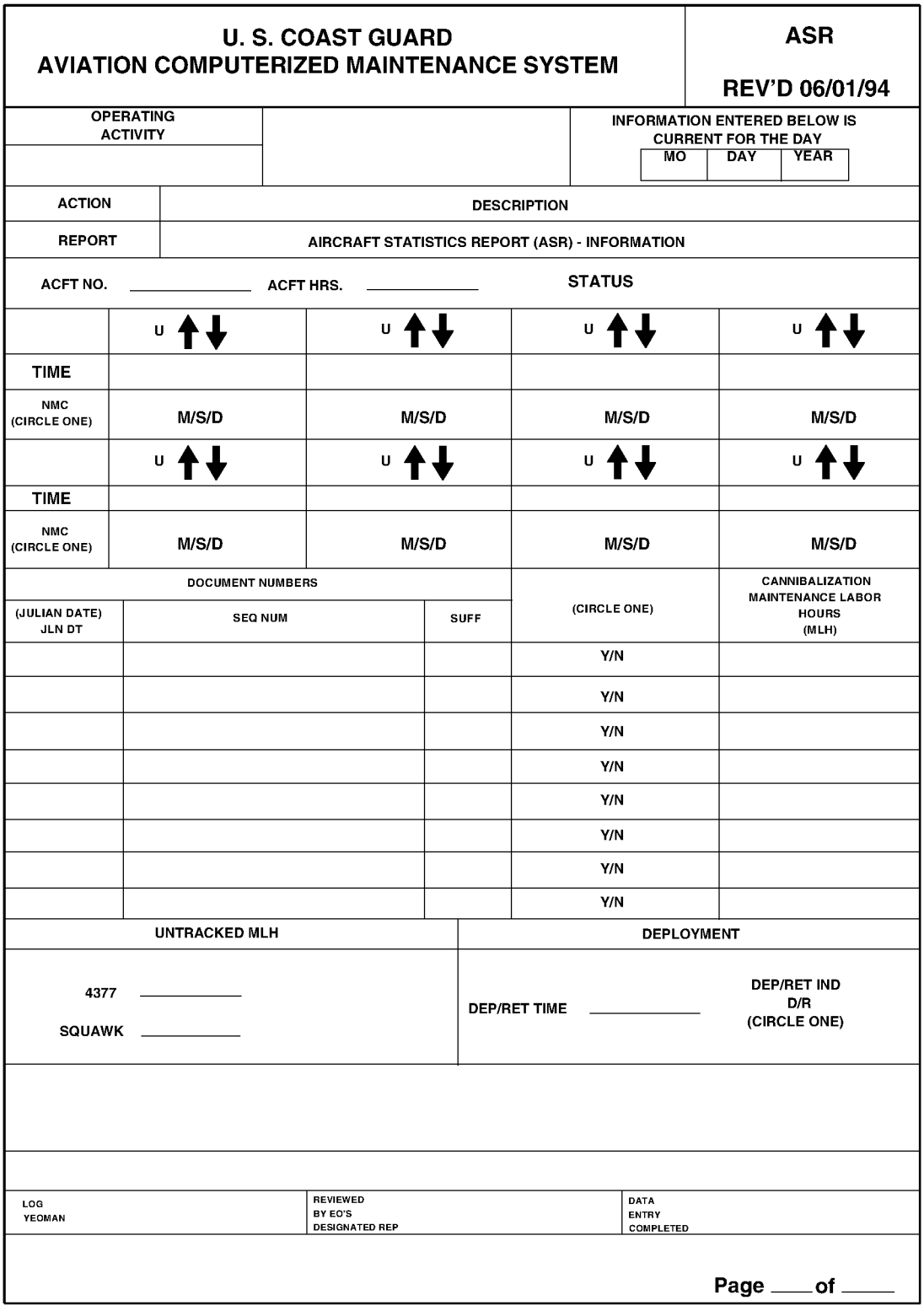
Page 1 of 1

04001d

Figure 4-1. (Sheet 4 of 4)

Monthly Unit Operating Statistics (MORPT)

Figure 4-1. (Sheet 4 of 4)
Monthly Unit Operating Statistics (MORPT)



U. S. COAST GUARD
AVIATION COMPUTERIZED MAINTENANCE SYSTEM

ASR

REV'D 06/01/94

OPERATING ACTIVITY

INFORMATION ENTERED BELOW IS CURRENT FOR THE DAY

MO | DAY | YEAR

ACTION | DESCRIPTION

REPORT | AIRCRAFT STATISTICS REPORT (ASR) - INFORMATION

ACFT NO. _____ ACFT HRS. _____ STATUS

	U	U	U	U
TIME				
NMC (CIRCLE ONE)	M/S/D	M/S/D	M/S/D	M/S/D
	U	U	U	U
TIME				
NMC (CIRCLE ONE)	M/S/D	M/S/D	M/S/D	M/S/D

DOCUMENT NUMBERS			(CIRCLE ONE)	CANNIBALIZATION MAINTENANCE LABOR HOURS (MLH)
(JULIAN DATE) JLN DT	SEQ NUM	SUFF		
			Y/N	
			Y/N	
			Y/N	
			Y/N	
			Y/N	
			Y/N	
			Y/N	
			Y/N	

UNTRACKED MLH

4377 _____

SQUAWK _____

DEPLOYMENT

DEP/RET TIME _____ DEP/RET IND D/R (CIRCLE ONE)

LOG YEOMAN | REVIEWED BY EO'S DESIGNATED REP | DATA ENTRY COMPLETED

Page ____ of _____

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Figure 4-2. Aircraft Statistics Report (ASR)

Figure 4-2. Aircraft Statistics Report (ASR)

(1) The ASR form collects the following information:

Aircraft hours
Not Mission Capable (NMC) status of the aircraft

Aircraft parts causing an aircraft to be NMC for supply
Cannibalized aircraft parts

Maintenance labor hours reported via the CG-4377 Part I, CG-4377 Part III, CG-4377B, and Maintenance Discrepancy Report (squawk sheets)
Deployment times

(2) The information collected is used by the unit, ARSC, and Commandant (G-SEA) management personnel. The information on the ASR form is entered into the ASR module of the ACMS. Units are required to enter ASR information daily. ASR information may be entered into ACMS up to a **MAXIMUM** of 7 days after the form date.

(3) The ASR module of ACMS provides various reports. The following is a list of available reports:

Operating Statistics Report - Provides availability and flight hour data for an aircraft type eet wide.
How Gozit Report - Provides the unit with availability and flight hour data based on the units performance for the period selected. Data is only provided for the unit requesting the report.

NMC Data for Aviation Maintenance Management Information System (AM-MIS) Report - Provides the NMC data needed by AMMIS for the AMMIS Flight Operations

Module.
ACMS Overall NMC/Flight Reports - Provides past and current fiscal year data.

NMC and % Program Hours Report - Provides data for a specific month.
Aircraft Grounded and Deployed Report - Provides daily NMC data for each aircraft at a unit. The report also shows each time an aircraft is deployed or returns from a deployment. By analyzing this report units should be able to determine periods in which they did not meet their readiness requirement.

B. AIRCRAFT REPORTS AND FORMS.

NOTE

Forms referenced in this manual are listed in Enclosure (22).

1. Required Reports. USCG aviation units will be required to submit the following reports and forms using Coast Guard and Air Force forms. Preparation and distribution of these reports and forms shall be in accordance with the prescribing directives unless otherwise listed below.

Prescribing	Form Title	Directive	Applicable Aircraft
CG-22	Aeronautical Publication Change Recommendation	CGTO PG-85-00-20	All
AF Form 847	Recommendation for Change of Publication (Flight and Standardization Manual)	Self-explanatory	All
AFTO 103	Aircraft Missile Condition Report	T.O. 00-25-4	HC-130

2. Description of Forms.

a. CG-22 - Aeronautical Publication Change Recommendation. This form shall be used to recommend corrections of errors which affect the meaning of information or procedures contained in COMDTINSTs, technical manuals, or ACMS which affect the applicable aircraft maintenance requirements. This form shall also be used for recommending changes in processes, procedures, or materiels that affect aircraft maintenance. See CG-22 Process Guide, CGTO PG-85-00-20, for instructions on preparing the CG-22. This form will be kept on file for 1 year.

b. AF Form 847 - Recommendation for Change of Publication. This form shall be used for submitting recommended changes to flight manuals. Preparation of the form is self-explanatory. Distribution shall be as follows:

HC-130

HC-130 Stan Unit, Elizabeth City, Aviation unit	Original and one copy
Commandant (G-SEA)	One Copy
Commandant (G-OCA)	One Copy
Prime Unit	One Copy

HH-65, HU-25, HH-60 Aircraft

AVTRACEN, TRADIV	Original and one copy
Commandant (G-SEA)	One Copy
Commandant (G-OCA)	One Copy
Prime Unit	One Copy

c. AFTO Form 103 - Aircraft Missile Condition Report. This report shall be used to document any unusual work required for aircraft which are scheduled for programmed depot maintenance at military or commercial activities. Items such as extensive corrosion repair or rework of temporary structure repairs should be documented. The form shall be prepared in accordance with AFTO 00-25-4 and routed as directed by the preinduction notice.

NOTE

Any aircraft scheduled for programmed depot maintenance at ARSC should note these repairs on the CG-5181, CG-4377 Part III, and/or CG-4377B.

(1) In order to document discrepancies as they occur, HC-130 reporting custodians shall maintain a running AFTO 103 in each aircraft logbook.

d. Standard Form 368. DOD has adopted this Quality Deficiency Report as a standard form for use in reporting quality deficiencies on all DOD owned materiel (i.e., components, engines, and aircraft). Regulations applicable to the use of SF 368 require that each service establish a central screening point for all SF 368 submissions. The following action will be taken by Coast Guard units when reporting quality deficiencies:

(1) Deficiency reports concerning components and engines, regardless of the overhaul/ repair activity involved, shall be submitted to ARSC, ATTN: Engineering Division via an Unsatisfactory Report (CG-4010). ARSC will function as the screening activity and will prepare and submit a SF 368 as required.

(2) Deficiency reports resulting from HC-130 Programmed Depot Maintenance (PDM) shall be prepared in message format by the receiving activity not later than 20 days after receipt of the aircraft, in accordance with AFTO 00-35D-54, USAF Deficiency Reporting and Investigating System. Commandant (G-SEA) shall be an information addressee.

(3) Deficiency reports pertaining to GSA procured tools shall be submitted to Com-mandant (G-SEA) utilizing SF 368. Commandant (G-SEA) will act as the screening activity for these reports and will provide follow-up action when required.

(4) Deficiency reports concerning aircraft having completed PDM at ARSC shall be submitted on a Letter Report as described in paragraph 4.H.

(5) Deficiency reports for aircraft initial delivery from manufacturer shall be submitted on a Letter Report as described in paragraph 4.I.

C. MISCELLANEOUS USAF/USN/USCG FORMS. The following USAF/USN/USCG forms will be used in accordance with the prescribing directive indicated:

Form		Prescribing Directive Title
DD 2026	Oil Analysis Request	NA 17-15-50 (series)
DD 2027	Oil Analysis Record	NA 17-15-50 (series)
DD 1574	Serviceable Tag-Materiel	Directive not required
DD 1577-2	Unserviceable (Reparable) Tag-Materiel	Directive not required
CG 1577-A	Unsatisfactory Report Tag Materiel	Directive not required
OPNAV 4790 (series)	History Record	OPNAVINST 4790.2 (series) VOL 2
OPNAV 4790/66	Technical Publications Deficiency Report	NA-00-25-100

NOTE

Convert OPNAV 4790 information to SCHR when component is enrolled. Maintain only the SCHR. Dual record keeping is not required.

NOTE

The terms A Condition, RFI, and serviceable are used interchangeably. The terms F Condition, NON-RFI, unserviceable and class 265 are used interchangeably. The preferred terms are serviceable and unserviceable.

1. Description of Miscellaneous Forms and Use Instructions.

a. DD-1574 - Serviceable Tag-Materiel. (Orange) This tag is attached to and identifies serviceable equipment. All entries

are self-explanatory. In the "Remarks" section, write the Aircraft Type if this part is used on a single aircraft type. Use the word "Multi" for parts that can be used on multiple aircraft types. See Figure 4-3.

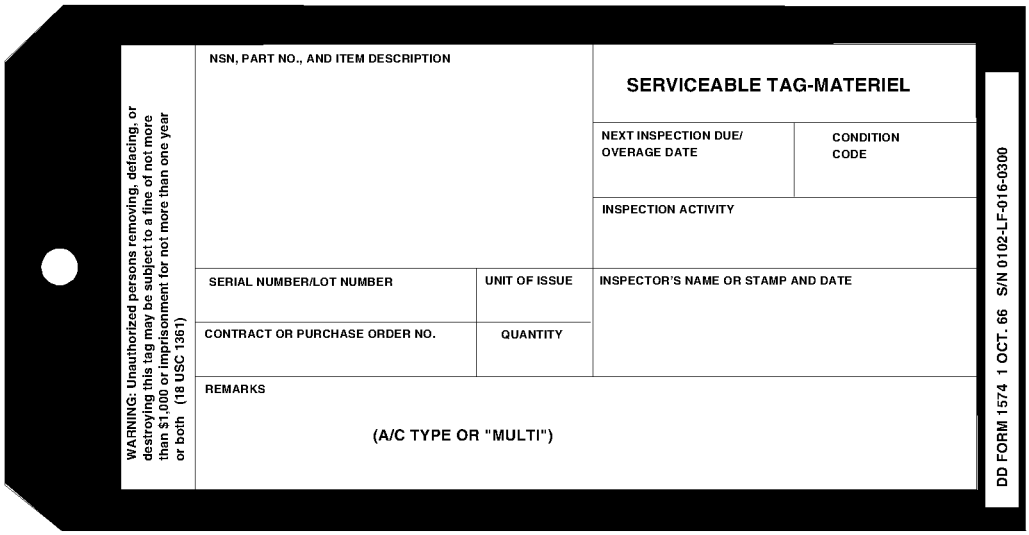

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Figure 4-3. DD-1574 Serviceable Tag-Materiel

Figure 4-3. DD-1574 Serviceable Tag-Materiel

b. DD-1577-2 - Unserviceable (Reparable) Tag-Materiel. (Green) This form will be attached to an unserviceable item upon removal and will remain attached through all maintenance processing until the item is serviceable. Entries are self-explanatory with the exception of the following: In the FSN, PART NO, and ITEM DESCRIPTION sections, write the NSN, Part Number, and item description of the removed part (these may be different than the replacement part information). In the CONDITION CODE section, write "F," in the REASON FOR REPARABLE CONDITION section write the failure mode if known (not "BROKE"). In the REMOVED FROM section, write the Aircraft Tail Number of the Aircraft Type for a non-installed part. See Figure 4-4.

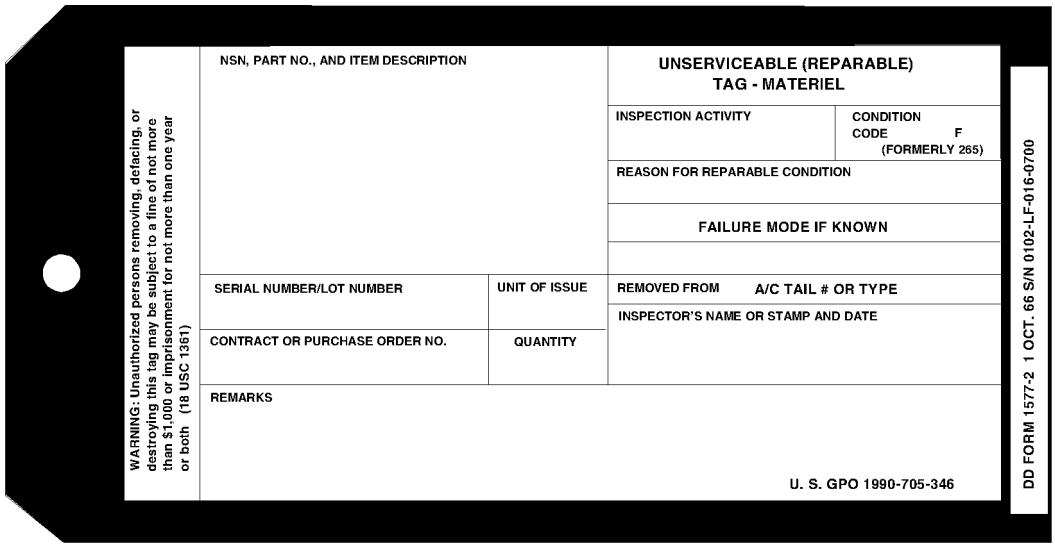

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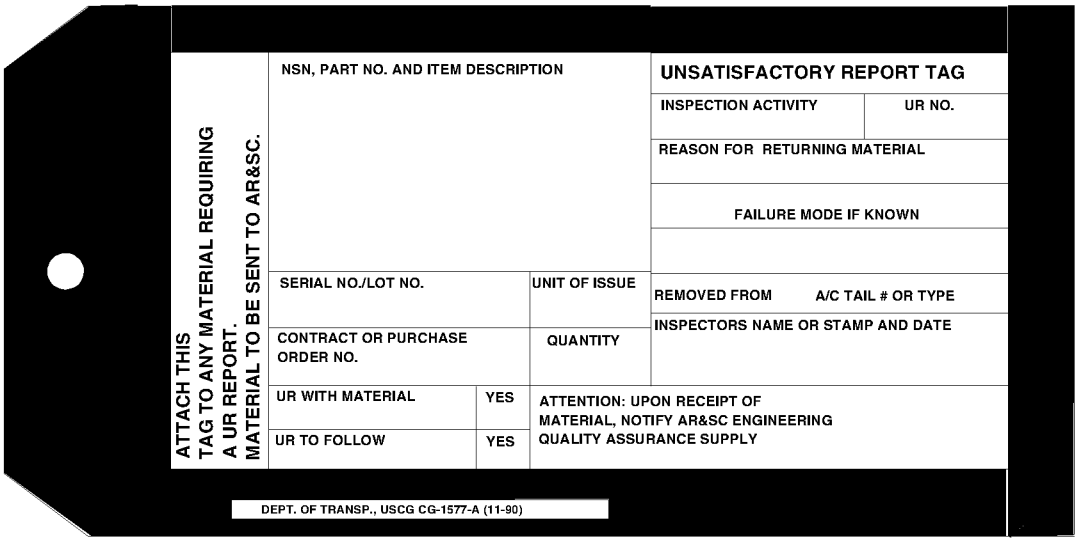
Figure 4-4. DD-1577–2 Unserviceable (Reparable) Tag-Materiel

c. CG-1577-A - Unsatisfactory Report (UR) Tag-Materiel. (Red/White/Blue) This form will be attached to any item, unserviceable or not, requiring a UR, special handling, or an engineering investigation upon removal from an aircraft or equipment end item and will remain attached through all processing until the item is serviceable. Entries are self-explanatory with the exception of the following: In the FSN, PART NO, and ITEM DESCRIPTION section, write the NSN, Part Number, and item description of the removed part (these may be different than the replacement part information). In the REASON FOR RETURNING MATERIEL section, write the failure mode if known (not "BROKE"). In the REMOVED FROM section, write the Aircraft Tail Number or the Aircraft Type for a non-installed part. See Figure 4-5.



04001h

Figure 4-5. CG-1577-A Unsatisfactory Report (UR) Tag-Materiel

NOTE

The backside of the Unsatisfactory Report tag is available for additional comments regarding "Reason for Returning Materiel."

D. SUPPLY INFORMATION.

1. USAF Forms. USAF forms are distributed at no cost from the Air Force Publications Distribution Center, Baltimore, Maryland, and through ARSC and the Coast Guard Engineering Logistics Center (ELC), respectively. USCG activities requiring USAF forms shall obtain them in the following manner:

   a. Forms. The USAF-type forms listed herein may be requisitioned from the Coast Guard Engineering Logistics Center, utilizing CG-4940, Surf Requisition Log in accordance with Catalog of Forms, COMDTINST M5213 (series). Requests to utilize other USAF-type forms shall be forwarded to Commandant (G-SEA), indicating estimated usage data. When additional USAF-type forms are approved for Coast Guard use, they will be listed in the Catalog of Forms, COMDTINST M5213 (series), and stocked at the Coast Guard Engineering Logistics Center.

E. STOCK LISTS. Complete USAF stock lists will not be required by field units. All federal cataloging, including the USAF's, will be included in the Master Cross Reference List MCRL-1 and MCRL-2 with basic issues to be distributed each quarter on microfiche from ARSC.

F. AIRCRAFT MAINTENANCE RECORDS. Aircraft Flight Record Forms shall be used by all aviation units to record flight and maintenance data. The Air Operations Manual, COMDTINST M3710.1 (series), contains specific information regarding the proper utilization of CG-4377 Parts I and II. This chapter provides specific information to maintenance personnel regarding the proper utilization of maintenance records. Figure 4-6. (CG-4377 Part III, Maintenance Record), Figure 4-7. (CG-4377A, Flight Safety Maintenance Document), Figure 4-8. (CG-4377B, NO FLY), Figure 4-9. (Maintenance Discrepancy Report), Figure 4-10. (CG-5181, Carry Forward Discrepancies), and Figure 4-11. (MPC, Carried Forward Discrepancies, HH-65) and their instructions provide details for completing these maintenance records. Maintenance personnel are required to make entries regarding the following situations:

1. Log Entries. The initials of the person transcribing CG-4377 Part III data to the appropriate aircraft, engine, or accessories log should be entered in the block provided.

2. CG-4377, Part III.

   a. Discrepancy: The following entries will be recorded on the CG-4377 Part III:

      (1) All flight-generated groundings.

      (2) All other flight-generated discrepancies.

      (3) All non- flight generated discrepancies recorded by the pilot-in-command.

NOTE

Units will use the CG-4377B for discrepancies that are not flight-generated, recorded by maintenance personnel.

   b. Corrective Action. The following provides guidelines for recording CG-4377 Part III Corrective Action. (The mechanic should use explicit, concise terms to describe the action taken to correct the discrepancy noted. Entries such as "ground checks OK" should not be used.)

      (1) The mechanic responsible for the corrective action taken must legibly sign (not initial) in the appropriate space.

(2) Man-Hours. If a MPC was used for corrective action, record man-hours on the MPC and place "ACMS" in the block. If not, record man-hours; including time for research, locating parts, completing documentation, and QA inspection.

(3) Quality Assurance release signature (mandatory for any grounding discrepancy; flight control work, including; trim tabs, rigging work, engine change, prop or governor work, landing gear system work). Entered by a primary or collateral duty quality assurance inspector.

(4) Maintenance Release. A maintenance release is required for a grounded aircraft before the aircraft can be released for flight. The Engineering Officer is authorized to maintenance release aircraft at his or her unit. Additional officers or petty officers at the unit qualified to sign a maintenance release must be designated in writing. (See Enclosure (5) for a sample letter.)

c. Delay of Corrective Maintenance Action. If corrective maintenance action is delayed beyond 24 hours, the asterisked box immediately preceding the corrective action block must carry one of the following symbols:

CF - Indicates carried forward
PP - Indicates pending parts

In this case, NO OTHER ENTRY SHALL BE MADE (except the initials of the person who authorized the delay) in the corrective action block. See Figure 4-6. Any delayed corrective action symbol MUST be initialed by the Engineering Officer or his or her designated representative prior to release of the aircraft for flight. All carry forward discrepancies shall be transferred to CG-5181. When clearing CG-5181 entries (delayed discrepancies) they must be reentered on the CG-4377B, and signed off with the appropriate corrective action.

CAUTION

THE REMOVAL OR ADDITION OF COMPONENTS WITHIN THE AIRCRAFT MAY SIGNIFICANTLY ALTER THE BASIC AIRCRAFT CENTER OF GRAVITY. THE UNIT WEIGHT AND BALANCE OFFICER WILL BE NOTIFIED OF ALL AIRCRAFT CONFIGURATION CHANGES SO THAT A REVISED WEIGHT AND BALANCE FORM F (DD FORM 365F) MAY BE COMPLETED PRIOR TO FLIGHT.

NOTE

With the exception of deployed aircraft, no corrosion discrepancies shall remain open for a period longer than 30 days without the approval of the Unit Engineering Officer or his/her designated representative.

INSTRUCTIONS FOR COMPLETING THE CG-4377 PART III (Figure 4-6.)

(1,2,3,4,5,8) AIRCRAFT MODEL, AIRCRAFT NUMBER, UNIT, DATE, FLIGHT TIME,

PILOT: These will be automatically annotated when Part I is filled out by the pilot, by carbon transfer.

(6,7) NUMBER OF LANDINGS/ENGINE START CYCLES: Logged by the pilot for the tracking of total A/C landings and Engine Start Cycles.

(9) AIRCRAFT CONDITION: Circle the appropriate ARROW from left to right. When the aircraft is released for flight from a grounded condition, the releasing authority will circle the UP ARROW and initial next to the circle.

(10) TOTAL NOR: This area should be left blank.

(11) MPC/LOG ENTRIES COMPLETE: This area can be used to track ACMS.

(12) "X" if GROUNDED: Mark an "X" in this block if the discrepancy is considered grounding.

(13,14) TIME/DATE: Write the time and date that the discrepancy is written. This applies to all grounding and nongrounding discrepancies.

(15) NF: Check block if the discrepancy is non- flight related and noted by the pilot-in-command.

(16,17) DISCREPANCY: Print the discrepancy in concise simple language that fully explains the problem.

(18) MAINTENANCE RELEASE IF GROUNDED: Signature of the Engineering Officer or his/her representative who is authorized to release an aircraft for flight after the grounding discrepancy has been signed off as complete.

(19) "+'': Print "PP" (Parts Pending) or "CF" (Carried Forward) only. This block must be completed if maintenance will be delayed more than 24 hours. Any time block (19) is completed, the discrepancy must be transferred to the CG-5181. If "PP" is used, a document number must be logged on the CG-5181 within 3 working days. All "CFs" and "PPs" must be initialled by the Engineering Officer or his/her designated representative. Once this block is utilized, the discrepancy must be reentered on the CG-4377B when the corrective action is completed. Grounding discrepancies cannot be Parts Pending or Carried Forwarded.

(20) CORRECTIVE ACTION: Use plain language to fully describe all of the maintenance performed. List all references used in the correction of the discrepancy. No discrepancy can be transferred to the Maintenance Discrepancy Report (MDR) without approval from the Engineering Officer or his/her representative. Write the tool box number that was utilized for the correction of the discrepancy.

(21,22) TIME, DATE: On non-grounding discrepancies, the mechanic must fill in each of these blocks after the discrepancy has been corrected. On grounding discrepancies, the Engineering Officer or his/her designated representative who is authorized to release an aircraft for flight must fill in each of these blocks when the aircraft is released for flight.

(23,24) MECH SIGNATURE, RATE: The mechanic must fill in each of these blocks after the discrepancy has been corrected.

(25) MAN-HOURS: Print "ACMS" for discrepancies that utilize an ACMS MPC. All other time entries shall utilize the hour and tenth hour format (example, 4.2).

(26) QA RELEASE: Any grounding discrepancy or maintenance procedure that requires a quality assurance inspection must have a signature in this block.

(27) ENGINE/PROP OIL ADDED: Self explanatory.

(28) LUBE OIL ADDED: Self explanatory.

(29) HYD FLUID ADDED: Self explanatory.

(30) TOTAL A/C TIME: Transfer the time from block (5) to the "TIME THIS FLIGHT." Transfer the "NEW TOTAL" time from the previous CG-4377 Part III or CG-4377B to the "PREVIOUS TOTAL" block on the current CG-4377 Part III. Add these together to compute the "NEW TOTAL."

3. CG-4377A.

a. Use of form.

(1) Inform the pilot that maintenance has been accomplished that could affect the characteristics of flight.

(2) If ground checks are the only requirement for the release for flight, blocks (11) and (12) do not require a signature.

(3) A description of all functional checks that are required must be written as an open discrepancy on the CG-4377B. This discrepancy will only be signed off upon satisfactory completion of the required functional checks.

INSTRUCTIONS FOR COMPLETING THE CG-4377A (Figure 4-7.)

(1, 2, 3, 4) AIRCRAFT MODEL, AIRCRAFT NUMBER, UNIT, DATE: Self explanatory.

(5) DESCRIPTION OF MAINTENANCE PERFORMED: Print the description in concise simple language that explains the maintenance performed. List the references that the maintenance was performed IAW.

(6) GROUND CHECK, FLIGHT VERIFICATION, TEST FLIGHT: Check the appropriate box(es), refer to paragraph 1.O.1. for an explanation of each term.

(7) MAINTENANCE DATA: Self explanatory.

(8) GROUND CHECK: All checks that must be accomplished on the ground by the mechanic/technician have been accomplished IAW applicable publications.

(9) QA INSPECTION: Self explanatory.

(10) MAINTENANCE RELEASE: Self explanatory.

FUNCTIONAL CHECK FLIGHT:

(11) QA must brief the pilot who is going to accomplish any in-flight check. A signature in this block indicates that the pilot has been briefed and understands what must be accomplished.

(12) The signature block will be signed after satisfactory completion of the functional check flight item. If the test flight portion is unsatisfactory, leave block (12) blank. Subsequent test flight pilots will date and sign block (11) above existing signature(s).

4. CG-4377B.

a. This form is called the NO FLY. It should be reproduced on white paper only to readily identify non- flight generated discrepancies, including aircraft suspended from ACMS. See paragraph 8.E.5.

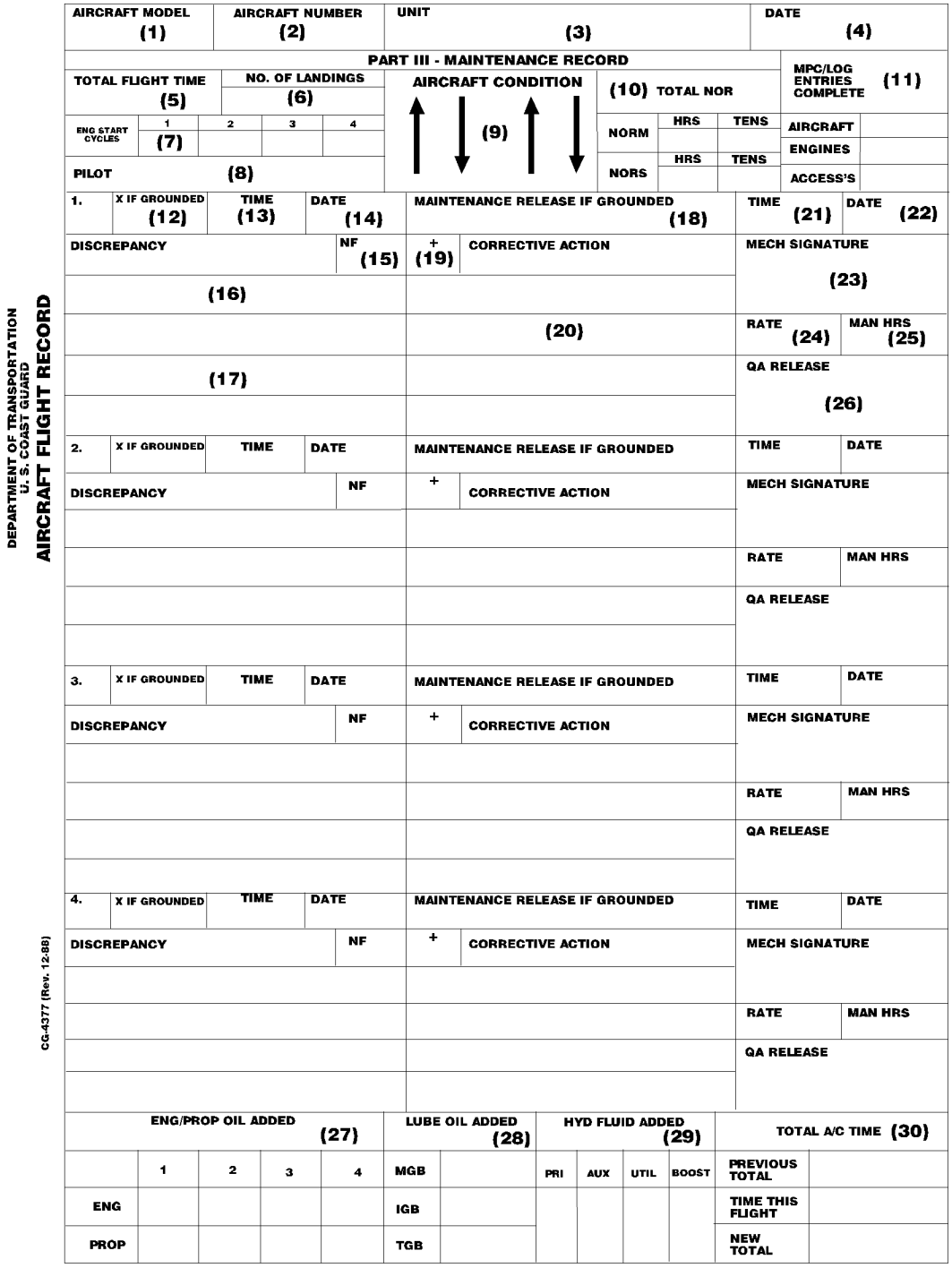


Figure 4-6. CG-4377 Part III, Maintenance Record

AIRCRAFT MODEL (1)	AIRCRAFT NUMBER (2)	UNIT (3)	DATE (4)

FLIGHT SAFETY MAINTENANCE DOCUMENT

DESCRIPTION OF MAINTENANCE PERFORMED

(5)

DEPT. OF TRANSP. USCG-CG4377A(4-84) SN 7530-01-GF3-0970

FUNCTIONAL CHECKS REQUIRED

CHECK APPLICABLE BOX/BOXES (6)

☐ GROUND CHECK ☐ FLIGHT VERIFICATION ☐ TEST FLIGHT

MAINTENANCE DATA		
I CERTIFY THAT THE MAINTENANCE HAS BEEN ACCOMPLISHED IAW THE APPLICABLE PUBLICATIONS: (7)	DATE	SIGNATURE MECHANIC
GROUND CHECK		
I CERTIFY THAT THE REQUIRED GROUND CHECKS HAVE BEEN COMPLETED IAW THE APPLICABLE PUBLICATIONS: (8)	DATE	SIGNATURE MECHANIC
QA INSPECTION		
I CERTIFY THAT THE MAINTENANCE DESCRIBED HAS BEEN DETERMINED ADEQUATE AND GROUND CHECKED: (9)	DATE	SIGNATURE QUALITY ASSURANCE INSPECTOR
MAINTENANCE RELEASE		
THIS AIRCRAFT IS RELEASED FOR FUNCTIONAL CHECK AS INDICATED ABOVE: (10)	DATE	SIGNATURE AUTHORIZED REPRESENTATIVE
FUNCTIONAL CHECK FLIGHT		
I HAVE BEEN BRIEFED BY A QA INSPECTOR AND WILL CONDUCT THE REQUIRED CHECKS: (11)	DATE	SIGNATURE PILOT IN COMMAND
ALL FUNCTIONAL CHECKS HAVE BEEN SATISFACTORILY COMPLETED: (12)	DATE	SIGNATURE PILOT IN COMMAND

04003a

Figure 4-7. CG-4377A, Flight Safety Maintenance Document

INSTRUCTIONS FOR COMPLETING THE CG-4377B (Figure 4-8.)

(1, 2, 3, 4) AIRCRAFT MODEL, AIRCRAFT NUMBER, UNIT, DATE: Self explanatory.

(5) CYCLES/STARTS: Log the total Cycles/Starts accumulated on each sheet.

(6) AIRCRAFT CONDITION: Circle the appropriate ARROW from left to right when the aircraft is released for flight. From a grounded condition, the releasing authority will circle the UP ARROW and initial next to the circle.

(7) NMCM/NMCS/NMCB: This area can be used to log total NMCM/NMCS/NMCB for each CG-4377B.

(8) MPC/LOG ENTRIES COMPLETE: This area can be used to track total ACMS hours for each category.

(9) "X" if GROUNDED: Mark an "X" in this block if the discrepancy is considered grounding.

(10, 11) TIME/DATE: Write the time and date that the discrepancy is written. This applies to all grounding and non-grounding discrepancies.

(12) DISCREPANCY: Print the discrepancy in concise simple terms that fully explain the problem.

(13) NAME: Print the name of the person writing the discrepancy.

(14) MAINTENANCE RELEASE IF GROUNDED: Signature of the Engineering Officer or his/her designated representative who is authorized to release an aircraft for flight after the grounding discrepancy has been signed off as complete.

(15) "+": Print "PP" (Parts Pending) or "CF" (Carried Forward) only. This block must be completed if maintenance will be delayed more than 24 hours. Any time block (15) is completed, the discrepancy must be transferred to the CG-5181. If "PP" is used, a document number must be logged on CG-5181 within 3 working days. All "CFs" and "PPs" must be initialed by an Engineering Officer or his/her designated representative prior to release for flight. Once this block is utilized, the discrepancy must be reentered on the CG-4377B. The first line in block (12) shall be "FROM 5181." Grounding discrepancies cannot be Carried Forward or Parts Pending.

(16) CORRECTIVE ACTION: Use plain language to fully describe all of the maintenance performed. List all references used to correct the discrepancy. No discrepancy can be transferred to the Maintenance Discrepancy Report (MDR) without approval from the Engineering Officer or his/her representative.

(17) TOOL BOX #: Used to log the tool box number that was utilized for the correction of the discrepancy.

(18, 19) TIME, DATE: On non-grounding discrepancies, the mechanic must fill in each of these blocks after the discrepancy has been corrected. On grounding discrepancies, the Engineering Officer or his/her designated representative who is authorized to release an aircraft for flight must fill in each of these blocks when the aircraft is released for flight.

(20, 21)MECH SIGNATURE, RATE: The mechanic must fill in each of these blocks after the discrepancy has been corrected.

(22) MAN-HOURS: Print "ACMS" for discrepancies that utilize an ACMS MPC. All other time entries shall utilize the hour and tenth hour format (example, 4.2).

(23) QA RELEASE: Any grounding discrepancy or maintenance procedure that requires a quality assurance inspection must have a signature in this block.

(24) ENGINE/PROP OIL ADDED: Self-explanatory.

(25) LUBE OIL ADDED: Self-explanatory.

(26) HYD FLUID ADDED: Self-explanatory.

(27) TOTAL A/C TIME: Self-explanatory.
The page number is used to track consecutive NO FLYs. The pages should be tracked by the date in block (4). The consecutive numbers will end when a CG-4377 Part III is inserted into the logbook after a flight.

5. Maintenance Discrepancy Report.

a. This is an ACMS form used to track corrosion and other types of delayed action discrepancies. These discrepancies can not remain open beyond 30 days without the authorization of the Unit Engineering Officer or his/her authorized representative.

INSTRUCTIONS FOR COMPLETING THE MAINTENANCE DISCREPANCY REPORT (Figure 4-9.)

NOTE: With the exception of deployed aircraft, no corrosion discrepancies shall remain open for a period longer than 30 days without the approval of the Unit Engineering Officer or his/her authorized representative.

(1, 2, 3) AIRCRAFT MODEL, A/C NUMBER, OPERATING ACTIVITY: Self-explanatory.

(4) REPORTED BY: Print the name of the person writing the discrepancy.

(5) DATE: Self-explanatory.

(6) DESCRIPTION: Print the description in concise simple language that fully explains the problem.

(7) ACTION TAKEN: Use plain language to fully describe all of the maintenance performed. List all references used to correct the discrepancy.

(8) CORRECTED BY: Signature of the person correcting the discrepancy.

(9) ACMS CODE: If an ACMS card was used to correct the discrepancy, print the ACMS Code. If not, check "N/A."

(10) MPC SUBMITTED: If an ACMS MPC was submitted to correct the discrepancy, check the appropriate block.

(11) DATE: Self-explanatory.

(12) QA INSPECTOR: Signature of the quality assurance inspector if the discrepancy requires a quality assurance inspection.

(13) REVIEWED BY: Signature of the maintenance supervisor upon completion of the whole sheet.

(14) REVIEWED FOR ASR: Signature of the log yeoman when data is collected for the Aircraft Statistics Report (ASR).

(15) EO 30 DAY AUTHORIZATION: Self-explanatory.

6. CG-5181. (See Figure 4-10.)

   a. Delayed maintenance discrepancies from the CG-4377 Part III or CG-4377B where action must be delayed for more than 24 hours (either Carry Forward (CF) or Parts Pending (PP) discrepancies).

   b. A limit to the operational use of the aircraft.

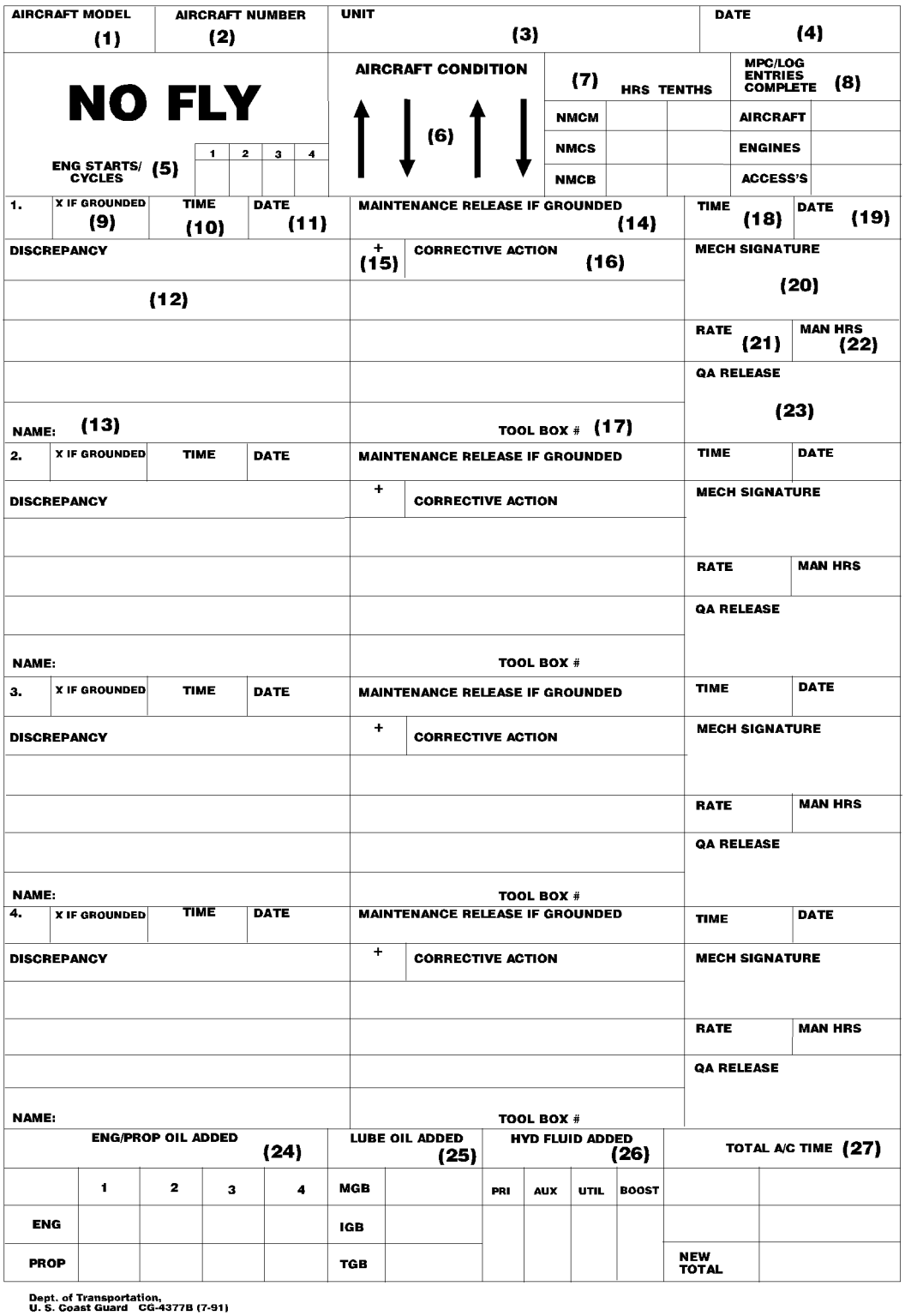
   c. Special inspection requirements (i.e., TCTOs and retorques).

   d. The intervals for these inspections will be as specified on the CG-5181 series.

   e. Cannibalization entries.

   f. No discrepancy may be transferred to the Maintenance Discrepancy Report (MDR) without approval from the Engineering Officer or his/her designated representative.

7. Cannibalization. All cannibalization incidents shall be authorized by the Engineering Officer or his/her designated representative and recorded on the CG-5181. In addition, a discrepancy notation shall be entered on the CG-4377B for the aircraft component that was cannibalized. Certain components cannot be cannibalized. The NO CANNIBALIZATION items will be listed on the aircraft type specific ACMS Maintenance Procedure Card if applicable.



AIRCRAFT MODEL (1)	AIRCRAFT NUMBER (2)	UNIT (3)	DATE (4)

NO FLY

ENG STARTS/ CYCLES (5)

1	2	3	4

AIRCRAFT CONDITION (6)

(7) HRS	TENTHS	MPC/LOG ENTRIES COMPLETE (8)	
NMCM		AIRCRAFT	
NMCS		ENGINES	
NMCB		ACCESS'S	

1.	X IF GROUNDED (9)	TIME (10)	DATE (11)	MAINTENANCE RELEASE IF GROUNDED (14)	TIME (18)	DATE (19)

DISCREPANCY	+ (15)	CORRECTIVE ACTION (16)	MECH SIGNATURE (20)
(12)			
			RATE (21) / MAN HRS (22)
			QA RELEASE (23)
NAME: (13)		TOOL BOX # (17)	

2.	X IF GROUNDED	TIME	DATE	MAINTENANCE RELEASE IF GROUNDED	TIME	DATE

DISCREPANCY	+	CORRECTIVE ACTION	MECH SIGNATURE
			RATE / MAN HRS
			QA RELEASE
NAME:		TOOL BOX #	

3.	X IF GROUNDED	TIME	DATE	MAINTENANCE RELEASE IF GROUNDED	TIME	DATE

DISCREPANCY	+	CORRECTIVE ACTION	MECH SIGNATURE
			RATE / MAN HRS
			QA RELEASE
NAME:		TOOL BOX #	

4.	X IF GROUNDED	TIME	DATE	MAINTENANCE RELEASE IF GROUNDED	TIME	DATE

DISCREPANCY	+	CORRECTIVE ACTION	MECH SIGNATURE
			RATE / MAN HRS
			QA RELEASE
NAME:		TOOL BOX #	

ENG/PROP OIL ADDED (24)					LUBE OIL ADDED (25)		HYD FLUID ADDED (26)				TOTAL A/C TIME (27)	
	1	2	3	4	MGB		PRI	AUX	UTIL	BOOST		
ENG					IGB							
PROP					TGB						NEW TOTAL	

Dept. of Transportation,
U. S. Coast Guard CG-4377B (7-91)

Figure 4-8. CG-4377B, NO FLY Form

U. S. COAST GUARD
MAINTENANCE DISCREPANCY REPORT

FOR OPERATING ACTIVITY USE
DO NOT MAIL TO ACMS OPERATIONS CENTER

Rev'd 01/11/96

AIRCRAFT MODEL	A/C NUMBER	OPERATING ACTIVITY
(1)	(2)	(3)

DESCRIPTION		ACTION TAKEN	CORRECTED BY (8)	
REPORTED BY (4)	DATE (5)		ACMS CODE (9)	MLH (IF ACMS IS N/A)
(6)		(7)	MPC SUBMITTED? YES ☐ (10) NO ☐	EO 30 DAY AUTHORIZATION (15)
			DATE (11)	QA (12)

DESCRIPTION		ACTION TAKEN	CORRECTED BY	
REPORTED BY	DATE		ACMS CODE	MLH (IF ACMS IS N/A)
			MPC SUBMITTED? YES ☐ NO ☐	EO 30 DAY AUTHORIZATION (15)
			DATE	QA

DESCRIPTION		ACTION TAKEN	CORRECTED BY	
REPORTED BY	DATE		ACMS CODE	MLH (IF ACMS IS N/A)
			MPC SUBMITTED? YES ☐ NO ☐	EO 30 DAY AUTHORIZATION (15)
			DATE	QA

DESCRIPTION		ACTION TAKEN	CORRECTED BY	
REPORTED BY	DATE		ACMS CODE	MLH (IF ACMS IS N/A)
			MPC SUBMITTED? YES ☐ NO ☐	EO 30 DAY AUTHORIZATION (15)
			DATE	QA

DESCRIPTION		ACTION TAKEN	CORRECTED BY	
REPORTED BY	DATE		ACMS CODE	MLH (IF ACMS IS N/A)
			MPC SUBMITTED? YES ☐ NO ☐	EO 30 DAY AUTHORIZATION (15)
			DATE	QA

Reviewed By: (13) ______________________
(Maintenance Supervisor)

Reviewed for ASR: (14) ______________________
(Log Yeoman)

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Figure 4-9. Maintenance Discrepancy Report

DEPARTMENT OF TRANSPORTATION U.S. COAST GUARD CG-5181 (Rev. 3-81)	**CARRY FORWARD DISCREPANCIES**	A/C MODEL A/C NUMBER

SYMBOL	DISCREPANCY	DOC. # (PP ONLY)	DATE ENTERED	DATE COMP.	TRANSFERRED BY/	A/C MODEL
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CANNIBALIZATION RECORD (PP ENTRY REQUIRED ABOVE)

SYMBOL	PART REMOVED	INSTALLED ON A/C #	AUTHORIZED BY

SPECIAL INSPECTIONS/SERVICES RECORD

DESCRIPTION	FREQUENCY	NEXT DUE	NEXT DUE	NEXT DUE	NEXT DUE	NEXT DUE

Figure 4-10. CG-5181 Carry Forward Discrepancies Form

AIRCRAFT NUMBER	OPERATING ACTIVITY	U. S. COAST GUARD AVIATION COMPUTERIZED MAINTENANCE SYSTEM	HH-65 **5181-65-1** REV'D 07/30/95

MTC	DESCRIPTION	FREQ	NEXT DUE	NEXT DUE	NEXT DUE	NEXT DUE	NEXT DUE	NEXT DUE
05200.3	7 DAY INSPECTION	7 DAY (1 DAY)						

NOTE: THIS CARD IS TO BE USED IN CONJUNCTION WITH A CG-5181. THESE ITEMS ARE LOCALLY TRACKED ONLY AND DO NOT REQUIRE ACMS DATA ENTRY.

NOTE: AUTHORIZED FREQUENCY EXTENSION LISTED IN (PARENTHESIS).

REPLACEMENT CARDS AVAILABLE FROM ACMS.

Page 1 of 1

04007a

Figure 4-11. Sample MPC, Carried Forward Discrepancies, HH-65

DEPARTMENT OF TRANSPORTATION U.S. COAST GUARD CG 4010 (REV 10-94)	**UNSATISFACTORY REPORT OF AERONAUTICAL EQUIPMENT**	REPORTS CONTROL SYMBOL G-SEA-3006

REPORTING ACTIVITY	MAILING ADDRESS

IDENTIFICATION OF UNSATISFACTORY ITEM

REPORT NUMBER	OPFAC	AIRCRAFT MODEL	AIRCRAFT NUMBER	NAME OF UNSATISFACTORY ITEM
Y R				

PART NUMBER	SERIAL NUMBER	NATIONAL STOCK NUMBER

CONTRACT/PURCHASE ORDER NUMBER	ATA CODE	MANUFACTURER

HOURS SINCE NEW	NEW DATE	OVERHAUL/REPAIR ACTIVITY	HOURS SINCE OVERHAUL	OVERHAUL DATE	HOURS SINCE REPAIRED	REPAIRED DATE	EXHIB DISP

DETAILS (Description, Cause, Action Taken, Recommendations, Reference)

SIGNATURE/PHONE NUMBER OF INVESTIGATOR	DATE OF FAILURE	SIGNATURE OF COMMANDING OFFICER

PREVIOUS EDITIONS OBSOLETE 850-912 7530-00-F01-5570

04008a

Figure 4-12. CG–4010

8. Summary. The Engineering Officer or his/her designated representative shall review these forms on a daily basis. It is important that discrepancies which affect flight safety or system operation not be overlooked and corrective action be taken prior to flight. The CG-4377s are the documents that receive the most review before flight. Discrepancies transferred to the Maintenance Discrepancy Report from the CG-4377 Part III or CG-4377B must be approved by the Engineering Officer or his/her designated representative. Maintenance managers are required to implement procedures which will prevent "system related" or " flight safety" discrepancies from being entered on the Maintenance Discrepancy Report.

9. Disposition of Forms. Completed CG-4377 Part III, CG-4377A, CG-4377B, CG-5181, Maintenance Discrepancy Report, and CG-4010s shall be retained by the engineering section for a period of 1 year. Completed ACMS Maintenance Procedure Cards shall be retained for 90 days.

G. UNSATISFACTORY REPORT (UR) OF AERONAUTICAL EQUIPMENT (CG-4010). The UR form should be used to communicate information concerning failures of aeronautical equipment associated with flight, including mission equipment, Ground Support Equipment (GSE), and tools. Its primary purpose is to provide information which will be of value to management personnel in identifying a fleet-wide problem. Its secondary purpose is to track specific unit submissions, evaluate the performance of the component repair/overhaul facilities, and generate Quality Deficiency Reports (QDRs).

1. URs shall be submitted by ARSC, aviation units, and flight deck equipped cutters. Failed components or unsatisfactory conditions of aeronautical materiel will have a local UR number assigned by the submitting facility prior to shipping the component. The UR tag will be annotated with this number. All failed components, including Type 1 materiel, will have a UR tag (CG-1577-A) affixed to the component. The UR identification tag will also be affixed to the outside of the shipping container in a conspicuous place. A copy shall be enclosed with all shipping documents.

2. Failures or unsatisfactory conditions of aeronautical materiel affecting SAFETY OF FLIGHT shall be reported by message (see Figure 4-13. for example). If deemed appropriately, ARSC will forward message to other Coast Guard operating units of the affected aircraft type. Commandant (G-SEA) will route messages to other agencies if deemed appropriate. The message constitutes an urgent interim Unsatisfactory Report and must be followed by a completed form CG-4010 and associated UR tags in accordance with the preceding paragraph.

NOTE

Urgent interim UR messages shall be addressed to ARSC, Info Commandant (G-SEA), Prime Unit for the aircraft involved and ACMS. ARSC address shall include routing indicators to QA, Supply Item Manager, and Engineering Subsection. For example, ARSC//QA/HU25IM/FWSB//, ARSC//QA/HH65/RWSB//. Use of Address Indicator Groups (AIGs) to transmit message URs is not authorized unless directed by Commandant (G-SEA).

FM (Facility submitting the msg)

TO COGARD ARSC ELIZABETH CITY NC
INFO CCGD_____
COMDT COGARD WASHINGTON DC//G-SEA//
COGARD AIRSTA (Prime Unit for A/C Type)

TO COGARD ARSC ELIZABETH CITY NC//ACMS//
ACCT
BT
UNCLAS //N //

SUBJ: URGENT INTERIM UR NO. (Unit UR S/N)

A. (Appropriate Reference, i.e., Tech Order, MPC, etc.)
1. IN TEXT GIVE NECESSARY INFORMATION. USE G.I0
AS A GUIDE TO ENSURE THAT NO ESSENTIAL INFORMATION
IS OMITTED.
BT

Figure 4-13. Sample Message UR

NOTE

Urgent interim message URs will be confirmed with a follow-up written UR (CG-4010).

3. ACMS does not eliminate the need for the Unsatisfactory Report (UR) of Aeronautical Equipment. ACMS does provide failure trend information for tracked components. However, there is no mechanism in ACMS to " ag" premature failures. If a serviceable component is received in an unserviceable condition, this failure will not be recorded by ACMS. Also, only a small percentage of aircraft components are tracked by ACMS. The UR continues to be a valuable means of reporting unusual and premature failures of aeronautical equipment.

4. URs shall be submitted for items that are under warranty or are contractor maintained. URs in those cases must be as comprehensive as possible to document the mode of failure and to minimize warranty or contract disputes. A unit-originated UR shall be maintained for 1 year unless a specific request has been made, then it should be retained until answered, but not less than 1 year.

5. The Engineering Officer must make a subjective decision to submit a UR where such information is not already captured by the ACMS data base. For example, a UR is not required to report each failure of a generator that does not meet 75 percent of Time Before Overhaul (TBO), nor is a UR required to report that the generator spline was cracked in each case. ACMS provides such information in many formats. However, if unit experience indicates that in eight of ten removals, pin D of the cannon plug was corroded (a fact which was not noted on MPC remarks during sign off) or that the shipping container for the generator seems to put stress on the generator spline and may be a contributor; such information would be of value to management personnel and a UR should be submitted.

6. ARSC will review all URs. Many will be acted on upon receipt and generate Materiel Deficiency Reports or other investigative actions. In some cases, the originating unit will receive a follow-up report on the findings of the investigation. Engineering Officers desiring a specific response should state their request on the UR.

7. ARSC will use unit UR/OPFAC number for tracking and provide a monthly report by aircraft type. The report will cover the condition generating the UR and action proposed or taken. A copy of the report will also be made available to Prime Unit (for aircraft type).

8. Engineering Officers should establish local procedures to ensure that URs are submitted when appropriate, are based on a thorough evaluation, and are submitted promptly.

9. URs should be shipped with the failed component. Good management shall allow for timely completion of the UR. Units shall not delay shipment of the failed component if the UR is delayed. Annotate on the UR tag (CG-1577-A) "UR TO FOLLOW" and the UR number. If the UR is not received by ARSC within 14 days after receipt of the part, ARSC will generate a letter to the command requesting completion of the UR. The UR should be faxed to ARSC if the delay is extended or upon request from ARSC.

10. To ensure the proper handling of unserviceable components requiring Unsatisfactory Reports, the UR component identification tag (CG-1577-A) will be used in lieu of the Unserviceable (Reparable) Tag-Materiel (DD 1577-2). The following procedures will be used for processing these components.

    a. A UR number will be assigned to all Type 1 and direct shipped materiel at the unit prior to shipment (ref: paragraph 4.G.1). A UR tag (CG-1577-A) will be affixed to the component and another to the outside of the shipping container in a conspicuous place. It is not imperative that the UR accompany the failed component; however, the UR should be received by ARSC as soon as possible. Management will ensure shipment of the component is conducted in a timely manner. If the UR is not received by ARSC within 14 days after shipment of the part, ARSC will generate a letter to the command requesting completion of the UR.

    b. Components other than Type 1 will have a UR number assigned at the unit prior to shipping the component. The UR tag (CG-1577-A) will be annotated with this number.

    c. All failed components assigned a UR and/or those requiring special handling or engineering evaluation will have the UR tag (CG-1577-A) attached to the component. The UR identification tag will also be affixed to the outside of the shipping container in a conspicuous place.

11. Instructions for Use of CG-4010. (See Figure 4-12. for sample form.) *Mandatory entries

    a. *Report Number: Numbers shall be assigned consecutively starting at the beginning of each calendar year. For example, 94-02 would be the second Unsatisfactory Report prepared at the unit in 1994. The last block should contain "F" for Fixed Wing or "R" for Rotor Wing. DO NOT DUPLICATE the report number.

    b. *OPFAC: Self-explanatory.

    c. *Aircraft Model: For example, show aircraft model, HU-25A, B or C, HH-65, HH-60, and HC-130.

    d. Aircraft (Serial) Number: Self-explanatory.

    e. *Name of Unsatisfactory Item: Name of item as listed in Illustrated Parts Catalog. If name of item is longer than block available, abbreviate.

    f. *Part Number: Use part number as listed on part.

    g. *Serial Number: Serial number of unsatisfactory item, if available.

    h. *National Stock Number: National stock number of unsatisfactory item (13 digit number).

    i. Contract/Purchase Order Number: If the name plate data of the unsatisfactory item shows contract number, list it here.

    j. *Air Transport Association (ATA) Code: List number as shown in Illustrated Parts Catalog for the HU-25A, HU-25B, HU-25C and HH-65A and as shown in ACMS for the HC-130H, and HH-60J.

    k. *Manufacturer: Manufacturer of unsatisfactory item.

l. Hours Since New: Show the time since new, if available.

m. New Date: Date of item when new, if available.

n. Last Overhaul Activity: List the last overhaul activity, if available.

o. Hours Since Overhaul: Show the time since last overhaul, if available.

p. Overhaul Date: Date of last overhaul, if available.

q. Hours Since Repaired: Show the time since item was last repaired at depot level, either at the depot or by depot field team. Review the SCHR, if available.

r. Repaired Date: Date of last repair by depot or depot field team. Review the SCHR, if available.

s. *Exhibit Disposition: Report action taken in accordance with the following guidelines:

(1) Do not turn failed items over to contractor's representative without approval from ARSC Technical Services.

(2) When turning a failed item over to supply or overhaul activity, place a copy of the "UR" in a suitable envelope which is marked "UR" in large red letters, and attach to the failed item. On USAF equipment, mark "UR EXHIBIT" in red on envelope containing URs.

(3) Retain failed item for 60 days before scrapping.

(4) F (formerly 265).

t. *Details:

(1) *References: List publications or documents referenced.

(2) *Description: Describe the failure in clear concise terms. If photos or sketches are attached, mark them with the UR number and station for identification in case they become detached. Include the following information if appropriate:

(a) Pertinent changes, bulletins, and technical orders; include date incorporated.

(b) Give gross weight, maneuvers, thunderstorms, hard landings, etc., in reports concerning structural failures.

(c) For engine failure give operating parameters, known elements failed, and sequence of events. Analyze foreign materiel and/or metal particles. Specify engine bulletins not installed, if pertinent. Enclose one copy of engine UR in with engine. Include a copy of recent JOAP or SOAP (HU-25) data analysis, if applicable.

(d) Report excessively corroded engines, installed or spare.

(e) On URs concerning tires and tubes, give location, number of plies, fabric, new or recapped, name and date of manufacture and recap, estimated percentage of wear, reason and date of removal, and photo.

(f) Operating activities shall not disassemble instruments or instrument components to determine cause of internal failure. They are discouraged from disassembling other items to reduce the possibility of introducing problems which could distort subsequent investigation as to the cause of failure or malfunction.

(3) *Cause: Give cause of unsatisfactory condition if known; otherwise, omit this subheading.

(4) *Action Taken: Give a concise statement of action taken.

(5) Recommendations: Give recommendations if considered pertinent, otherwise omit this sub-heading.

(6) Response: Indicate any specific information desired by the reporting activity concerning the investigation of the unsatisfactory item, such as:

(a) Request UR follow-up.

(b) Request results of Engineering Investigation (EI), Disassembly Inspection Report (DIR), or Condition Exception Report (CER). See paragraph 10.F.

(c) Request confirmation of limits or procedures.

(7) Distribution: Show "standard" plus additional distribution above standard. If distribution is standard omit this subheading.

u. *Signature/Phone Number of Investigator: The Engineering Officer may designate a qualified commissioned officer, warrant officer, or petty officer as investigating officer. The investigating officer will sign the report.

v. *Date of Failure: Self-explanatory.

w. *Commanding Officer: The Commanding Officer or his/her designated representative will also sign the report. Designation of "BY DIRECTION" authority to the Engineering Officer is encouraged.

x. Distribution: URs will be distributed in accordance with the following standard and elective lists:

(1) Standard Distribution List:

(a) All URs:

Commandant (G-SEA)	0 Copies	Prime Unit to forward Safety of Flight URs when required.
ARSC, ATTN: Engineering Division, QA Branch	2 Copies	
Prime Unit for Aircraft Type	1 Copy	

(2) Elective Distribution List. In addition to the standard distribution, one copy may also be sent to each unit operating the same type aircraft or equipment if the originator considers that the information contained in the report is useful. The recommendations, however, are not binding on the units. Common sense should determine action taken. The Commandant must approve changes to inspection intervals and procedures, and changes or modifications to aeronautical equipment. Advance copy may be faxed to ARSC, ATTN: QA, (919) 335-6849.

H. POST PDM REPORT.

1. After the PDM induction of an aircraft at ARSC, several Inspection and Evaluation (I&E) processes are completed on the airframe and its components for the purpose of evaluating the condition and determining the disposition of the same. These I&E processes include the determination and mapping of the extent of airframe corrosion. Upon the completion of these I&E processes, the Commanding Officer, ARSC, will provide a Post Induction letter to the Commanding Officer of the inducting unit, with an information copy to Commandant (G-SEA). This letter will outline the general condition of the inducted aircraft and identify any unique or unusual problem areas discovered during the preliminary stages of PDM. This documentation should be useful to field units in highlighting areas of their aircraft maintenance program where greater emphasis is required. This information is provided to units by ARSC solely as feedback to assist in eetwide maintenance standardization with the long-term goal

of narrowing the variability of aircraft condition upon PDM induction, thereby reducing overall product line costs.

2. The unit receiving an aircraft from ARSC PDM shall submit a letter report (Figure 4-14.) to the Commanding Officer, ARSC, with an information copy to Commandant (G-SEA), identifying discrepancies that are directly attributable to the PDM effort. This letter will include only those discrepancies encountered during the first 14 days of operational availability at the reporting unit. In no case shall the letter be submitted later than 30 calendar days after aircraft acceptance. The post PDM report discrepancies must be detailed and exact in description so that ARSC will be provided enough information for identification and correction of specific deficiencies in their PDM procedures. Photographs are helpful in documenting problem areas. Discrepancies should be reported as either major or minor. A major discrepancy is one which affects safety-of- flight or grounds the aircraft. A minor discrepancy is any other discrepancy which would allow ARSC to improve their PDM efforts.

13000

From: Commanding Officer, (Unit submitting the report)

To: Commanding Officer, Coast Guard Aircraft Repair and Supply Center

Subj: POST PDM REPORT FOR AIRCRAFT CGNR _____

Ref: (a) COMDTINST M13020.1__

1. In accordance with the requirements listed in reference (a) the following report is submitted as a post PDM report for CGNR _____ received at this unit on (date).

2. The following were major discrepancies noted, corrective action taken, and man-hours expended:

a. Discrepancy: Oil leaks at the #2 filter bowl. O ring replaced several times and filter bowl replaced twice. Leak persisted.
Corrective Action: Replaced #2 oil pump housing.
Man-hours Expended: 27

3. The following were minor discrepancies noted, corrective action taken, and man-hours expended:

a. Discrepancy: Torque split of 10% between #1 and #2 engines in a hover.
Corrective Action: Completed torque calibration IAW MPC 77007.0 and anticipator adjustment IAW MPC 76001.3.

b. Discrepancy: Starboard position light lens cracked.
Corrective Action: Replaced with new lens.
Man-hours Expended: 0.5

4. (Supplemental Information, Points of Contact, Recommendations, and Future Maintenance Arrangements involving ARSC.)

COMMANDING OFFICER
or
ENGINEERING OFFICER
"By direction"

Copy: Commandant (G-SEA)

Figure 4-14. Sample Post PDM Report

3. Units with aircraft undergoing a PDM type of maintenance at a facility other than ARSC will submit the required forms and reports in accordance with the respective overhaul facility's applicable directive(s).

NOTE

Letter reports shall not be delayed past the submittal date on the basis of including some future discrepancy. Discrepancies discovered after the 14 day period, that can be attributed directly to the aircraft PDM, shall be submitted expeditiously via a subsequent letter report referencing the initial post PDM report.

4. All discrepancies reported in the unit's post PDM report will be investigated by ARSC. The findings and resultant action taken by ARSC on major discrepancies will be provided to the reporting unit by letter with a copy to Commandant (G-SEA).

I. POST DELIVERY REPORT FOR NEW AIRCRAFT.

1. A letter report, in the same format as the post PDM letter, will be used for reporting deficiencies discovered on new aircraft delivered to operating units. The report shall be submitted as described in paragraph 4.H.2., no later than 30 calendar days after acceptance at the receiving unit.

J. MEASURE OF EFFECTIVENESS REPORT (MOE). A system of Measurements of Effectiveness (MOEs) indicates the performance of Coast Guard Aeronautical Engineering as related to strategic plans and goals. A Measures of Effectiveness Report is produced semi-annually to reflect overall system performance. This report is the responsibility of the Commandant (G-SEA) staff and is distributed to selected managers on the Commandant (G-SEA) staff and at ARSC. Copies will be provided to Air Stations and other interested parties upon request.

1. The MOE report consists of data points and multi-dimensional MOE indices presented graphically for each Coast Guard aircraft type. The data points and MOEs are considered over sufficient periods of time to enable conclusions relative to system performance and strategic goals.

2. Data points are reported at regular intervals by all Coast Guard Air Stations, ARSC, and PDM contractors. They are derived by answering questions, such as: "What indicators will tell us if our aircraft are reliable?" The data points used in the Aeronautical Engineering MOE system are:

   Not Mission Capable Due to Maintenance (NMCM)
   Not Mission Capable Due to Supply (NMCS)

   Not Mission Capable Due to Depot Maintenance (NMCD)
   Total Stock Position

   Direct Maintenance Costs
   Maintenance Labor Hours Expended at Units

   Maintenance Labor Hours Expended at Depots
   Total Flight Time

   Dispatch Rate
   B-0 Rate

   MOE indices are multi-dimensional indicators of system performance.

   Most combine two or more of the data points listed above. The MOE indices are:

   Availability Index (AI)

Parts Availability Index (PAI)

Direct Cost of Ownership Index (DCOI)

Overall Maintenance Effort Index (OMEI)
Unit Level Maintenance Effort Index (UMEI)

Performance Reliability Index (PRI)
Commanding Officers' Customer Satisfaction Survey Index

Appropriate types of charts are presented for each MOE and data point. These charts pro-vide a sense of system performance in terms of each specific indicator. Overall trends, along with special and common causes, can be identified, particularly from control charts. Greater detail, although not provided in the regular reports for the sake of brevity, is available from the data base.

3. Operational Definitions of MOE Report Data Points:

DATA POINT	DEFINITION
NMCM	NMCM is the status of an aircraft which is Not Mission Capable because unit-level scheduled or unscheduled maintenance work (as defined in paragraph 1.D.3.a.) is in progress. NMCM time also includes the time the aircraft is grounded awaiting maintenance action or until the satisfactory completion of a test flight. Pre-thru-post flight inspections or servicing which would not delay a Bravo zero launch should not be logged as NMCM time. NMCM time does not include periods when the aircraft is down undergoing depot level maintenance (such as during drop-in depot-level maintenance performed at either ARSC, contractor sites, or other depot facilities, or during periods when depot field teams are performing depot-level work at an Air Station). NMCM is chosen as the cause of lack of aircraft availability when maintenance is the "driver" that prohibits resumption of Bravo status. For example, if an aircraft is down for a 600 hour inspection, and an adequate supply of parts and supplies are available to permit the inspection to proceed, then the aircraft is considered to be NMCM.
NMCS	Not Mission Capable due to Supply. NMCS is the status of an aircraft which is Not Mission Capable due to the lack of available parts or supplies. The NMCS `clock' starts when an aircraft is incapable of meeting mission readiness requirements, and corrective maintenance is being postponed because a required part is unavailable. The part should be acting as 'show-stopper,' i.e., its lack of availability is preventing maintenance from proceeding, and thereby acting as the driving factor causing the NMC condition. The NMCS clock stops as soon as the part is available to maintenance personnel. The NMCM clock starts at that point and stops again once the aircraft resumes Bravo readiness status.

DATA POINT	DEFINITION
NMCD	Not Mission Capable due to Depot Level Maintenance. NMCD reflects the percentage of time that aircraft of each type are unavailable for operational use at Air Stations due to scheduled or unscheduled depot level maintenance. Most NMCD time will be accrued at ARSC and contractor or DOD depots, but occasionally the Coast Guard makes a "business decision" to perform depot level maintenance at Air Stations. These NMCD periods need to be reflected in the total NMCD time, and should not count against unit NMCM rates. The criteria for accumulating NMCD time at units is: When depot level maintenance is performed by ARSC or Contractor's Field Teams. When unit personnel perform a specific ARSC authorized depot level repair or modification. When unit aircraft are sent for drop-in maintenance at either ARSC or at a contractor's site. Units report NMCD accumulated at the Air Stations on a monthly basis via the ASR form. NMCD accumulated at Depots includes PDM, drop-in maintenance, and all other depot level maintenance performed at the depot. The depot portion of NMCD is collected monthly by ARSC Repair Division and calculated as follows: $\text{NMCD} = \frac{\text{Avg \# Acft in Depot}}{\text{Total \# of Acft Type}} \times 100$ $\text{Avg \# Acft in Depot} = \frac{\text{Total Process Days for Type}}{\text{Days per Month}}$
MLHs Expended at Units	Maintenance Labor Hours (MLH) Expended at Units. The total MLHs expended at units as reported on ACMS tracked maintenance cards, CG-4377 forms, and on Maintenance Discrepancy Reports. Reported via the ACMS system, which includes the Aircraft Statistics Report (ASR). Does not account for all MLHs expended by units on CG aircraft (such as line and shop maintenance), but it does measure approximately 85% of the total. Audits and surveys can be done to determine standard differentials, and this data can be used to adjust reported MLHs.

DATA POINT	DEFINITION
MLHs Expended at Depots	Total labor hours expended on depot level maintenance by ARSC and contractor personnel. Limited to hours expended on airframe PDM only (component repair MLHs show up as Direct Maintenance Cost expenditures). Reported on monthly by ARSC and contractors and collected monthly by ARSC Repair Division.
Total Flight Time	Total flight time accrued for each aircraft type. Collected and reported on monthly through ACMS.
Total Stock Position	All CG owned, non-installed aircraft parts (serviceable and unserviceable Types 1, 2, and 4 parts) to include those at the following locations: ARSC Warehouse ARSC Shops Air Stations Commercial Vendors In-Transit Due-Ins from Vendors Data collected and reported monthly by ARSC accounting until provided by AMMIS.
Direct Maint-enance Cost	The total Cost: To repair parts used on aircraft To replace parts that were scrapped Of consumables used on aircraft Of PDMs Of emergency repairs Of overhead Of modifications (TCTOs) Tracked continuously by aircraft type and categories listed above through transaction records. Will be available monthly through AMMIS.
B-0 Rate	The percentage of time that Air Stations are able to meet their defined mission readiness requirements. Differs from NMC rates in that units are not expected to have all aircraft at B-0 or similar status. Typically, if one aircraft of the specific type is 'up,' then B-0 requirements are met, even though one or more of the unit's aircraft may be in NMC status. Reported on monthly through ACMS ASR form.

DATA POINT	DEFINITION
Dispatch Reliability Index	Anytime a pilot signs a "Yellow Sheet," the dispatch process is started. If the mission is own as assigned, with no abort of the flight due to maintenance reasons, then the process is a successful dispatch (SD). Any attempted flight that is aborted due to an aircraft system malfunction (which is not pilot or mission induced, e.g., overtorque, sheared hoist, weather, etc.) is considered a failed dispatch (FD). Thus the equation for Dispatch Reliability Index (DRI) is: $$DRI = \frac{[\quad SD \quad]}{[(SD + FD)]}$$ **NOTE** This data point indicates the ability of the Aeronautical Engineer-ing System to provide a reliable aircraft capable of completing assigned tasks. It should not be confused with NMC rates.

CHAPTER 5. DIRECTIVES AND PUBLICATIONS

A. COMMANDANT INSTRUCTIONS. These directives form the basis of the USCG directive system. Detailed information concerning the status of these directives and publications, as well as authorized allowances and the requirements for maintaining and filing, is contained in the Directives, Publications and Reports Index (COMDTNOTE 5600). Instructions for the preparation of these directives is contained in the Coast Guard Directives System, COMDTINST M5215 (series). It should be noted that while the majority of the directives published concerning aeronautical materiel will be assigned subject classification numbers in the 13000 (series), there are many other directives of interest to maintenance managers. See Index under Commandant Instructions.

B. TECHNICAL ORDERS. Technical Orders (T.O.s) are used to disseminate technical aeronautical information required for the operation and maintenance of USCG aircraft. The following formats are used based on the T.O. urgency.

C. PRECEDENCE OF DIRECTIVES. USCG directives have precedence over all others. Use of DOD instructions shall be tempered with good judgment. The precedence of directives is as follows:

1. Aviation Computerized Maintenance System (ACMS)
2. Coast Guard TOs
3. Air Force TOs
4. Navy TOs
5. Commercial Publications

NOTE

Air Force publications have precedence over Navy and commercial publications for general procedures that are non-aircraft specific. Coast Guard aircraft have maintenance manuals that are DOD or commercially sponsored (i.e., HC-130, Air Force; HH-60, Navy; HU-25 and HH-65, commercial).

D. REFERENCE PUBLICATIONS.

1. Air Force Index 2, Numerical Index of Standard Air Force Publications, contains a list of all Air Force Manuals (AFM) and pamphlets (AFP). See Enclosure (4).
2. Air Force Index 9, Numerical Index of Departmental Forms, contains the prescribing directives for the USAF, Air Force Technical Order (AFTO), and Department of Defense (DOD) forms listed herein.
3. AFTO 0-1-01 (series) contains a numerical listing of all USAF technical order indexes. Each index lists all technical orders for a specific category, e.g., T.O. 0-1-1-5 is the index for aircraft category technical orders pertaining to helicopters.
4. A1-H60CA-AML-000, Aircraft Documentation List.
5. AFTO 0-4-6-2, cross reference file of Equipment Numbers to Technical Order Numbers.
6. AFTO 00-5-18, USAF Technical Order Numbering System.
7. 00-25-100, Naval Air Systems Command Technical Manual Program.
8. N0000-00-IDX-000/TMINS, Navy Standard Technical Manual ID Numbering System.
9. OPNAV 4790.2 (series), Naval Aviation Maintenance Program Instructions.

E. COAST GUARD TECHNICAL ORDER SYSTEM. The Coast Guard Technical Order

System is the medium used to provide technical information and instructions to operate, install, maintain, inspect, or modify Coast Guard aviation systems and equipment. The T.O.s are published under authority of the Chief, Aeronautical Engineering Division, Office of Engineering Logistics and Development, U.S. Coast Guard, and distributed in accordance with the standard distribution list, COMDTNOTE 5605.

1. Coast Guard Technical Orders (CGTOs) are printed directives of long term nature (i.e., manuals referencing maintenance, repair, component, etc.).

2. Maximum use will be made of other service technical publications to avoid duplication of information. Occasionally, Maintenance Advisories will be issued to allow urgent dissemination of information prior to issuance of a Time Compliance Technical Order (TCTO), change to a Maintenance Procedure Card (MPC), or to clarify any published guidelines.

NOTE

When conflict of information exists, ACMS MPCs shall take precedence over CGTOs, which take precedence over other DOD publications.

3. Compliance with the Coast Guard Technical Order System is mandatory. Technical order instructions play a critical role in achieving system and equipment readiness. Commanding Officers shall ensure that activities under their jurisdiction are aware of the need for full compliance and effective use of the technical order system.

4. Coast Guard units will not make changes/corrections to T.O.s except as directed by official T.O. changes (either interim or formal). The CG-22 or AF Form 847 will be used to correct errors or voids in existing technical orders.

NOTE

Supply Item Change Records (SICRs), ARSC Form 3200-3 submitted by manufacturers or ARSC, changing or adding part numbers to any Coast Guard Illustrated Parts Catalog, or Illustrated Parts Breakdown may be incorporated directly from the approved SICR and not sent through the CG-22 process.

F. AIRCRAFT MAINTENANCE PUBLICATIONS.

1. General. Coast Guard aviation is involved in many tasks requiring a mix of aircraft types. The basic aircraft requirements were initially developed by the USAF, USN, or through commercial contractors requiring dependence on other than USCG sources for maintenance publications. The diversity of maintenance sources and changing information often requires USCG interpretation and resolution; this COMDTINST and the CGTO series will be utilized to resolve these ambiguities. Refer to Table 5-1. for detailed information.

2. Utilization.

   a. Air Force. The HC-130 and C-20B are Air Force sponsored aircraft. The Technical Information Maintenance and Ordering System (TIMOS) and Process Guide, CGTO PG-85-00-50, will have precedence over Air Force Technical Orders detailing the distribution and management of technical publications.

   b. Navy. The HH-60 is a Navy sponsored aircraft. The TIMOS System and Process Guide, CGTO PG-85-00-50, will have precedence over Navy publications detailing the distribution and management of technical publications.

   c. Commercial.

NOTE

Screening and studying commercial sources of technical information is considered advantageous and is encouraged. Changes to equipment which affect performance, part number, configuration or interchangeability are not authorized unless covered by an applicable USCG directive or otherwise specifically authorized.

(1) HU-25 and HH-65 maintenance publications are commercial publications written in Air Transport Association of America Specification 100 (ATA-100) format.

The basic manuals have been assigned CGTO numbers and are indexed by the ATA-100 numbering system. See Enclosure (8) for an explanation of ATA-100 format. There are a few exceptions where specific equipment has received a DOD designation and is supported by military (T.O.) publications.

NOTE

The flight handbooks are written according to military specifications.

(2) C-4A and C-20B maintenance publications are commercial and procedures for use are contained therein.

3. Procurement of Publications.

a. Coast Guard. All Coast Guard publications (including those for HH-65 and HU-25), aircraft model changes, and aircraft model bulletins may be ordered from ARSC utilizing TIMOS. Continuing requirements are mailed automatically in accordance with unit requirements on file at ARSC.

b. Air Force. USAF publications are currently obtained and distribution changed utilizing TIMOS.

c. Navy. Navy publications are currently obtained utilizing TIMOS.

d. Army. Army publications are ordered utilizing TIMOS.

e. Commercial. For the C-4A/C-20B, procure publications in accordance with their maintenance manual instructions. Other commercial publications for USCG peculiar requirements will be requisitioned from ARSC Publications Distribution Center through TIMOS.

G. PROCEDURES TO MAINTAIN T.O. LIBRARIES (FILES). TIMOS will be used for the maintenance and audit of Coast Guard Technical Libraries.

1. Maintain a hard copy of the Library Report, Library/Index Comparison Report, Allowance Report, and History Report.

2. All changes, supplements, RACs, etc., to technical manuals will be incorporated into the applicable manual within 5 working days.

3. Each unit will conduct semi-annual audits during the months of April and October. A Mandatory Special Requirements (MSR) card must be signed showing accomplishment of this task.

NOTE

The April audit will be conducted by QA and shops. The October audit will be conducted by the shops.

4. Each library will be organized alphanumerically in sections as follows:

a. COMDT Instructions, numerically

b. Airframe type (i.e.: HC-130, HH-60)

c. Air Force general publications

d. Navy general publications

e. Army general publications

f. Commercial and miscellaneous publications

H. TCTOS. The following formats are used based on the T.O. urgency.

1. Time Compliance Technical Orders (TCTOs) generally require a physical change to an aircraft or a special, urgent, or repeated inspection requiring compliance within specified time

limits. Applicability is determined by Commandant (G-SEA) and published in the ACMS Maintenance Due List (MDL) to track compliance. TCTO formats are contained in Enclosure (3).

NOTE

The TCTO numbering system has been revised to correspond to ACMS. The ACMS code is divided into four parts. The first number will always be a 9, which identifies the ACMS code as a TCTO. The next two digits indicate the ATA chapter that applies (i.e., Chapter 21 - Air Conditioning). The fourth and fifth digit refer to the sequential T.O. number within an ATA category. The last digit indicates the number of revisions issued to a specific TCTO. Coast Guard TCTOs issued prior to this revision will be listed under their original ACMS code. Therefore, some TCTOs will appear on the MDL and Maintenance Requirement List (MRL) as 99, 98, or 89 series TCTOs.

a. Coast Guard Message Time Compliance Technical Orders (Message TCTOs) are maintenance actions, in message format, used for rapid dissemination of information, generally of an urgent or safety-of- flight nature.

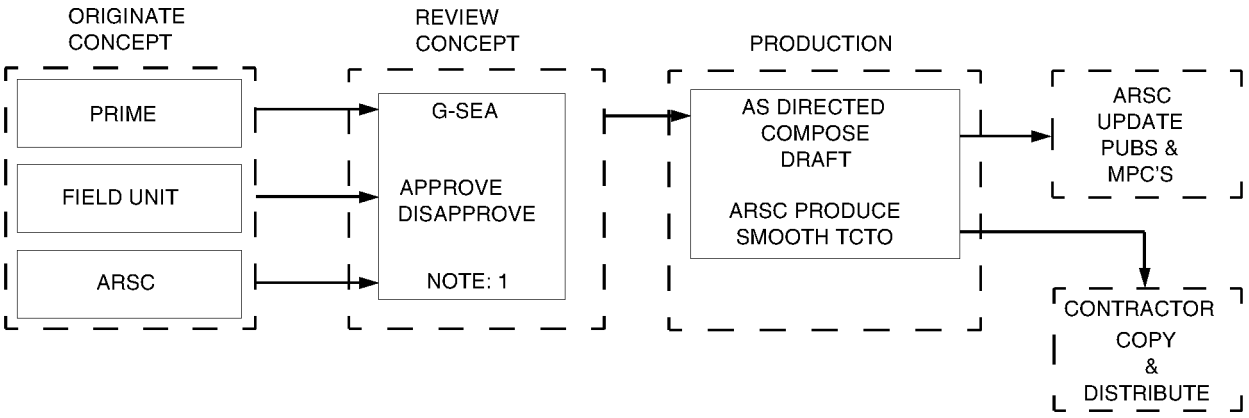
b. Coast Guard Time Compliance Technical Orders (TCTOs) are printed directives in MPC format requiring accomplishment of a specific task (i.e., inspection of components or physical change to an aircraft or component).

2. Compliance with Air Force TCTOs and TCTOs that apply to HC-130 and C-20B.

a. HC-130 and C-20B units shall comply with Air Force TCTOs and ITCTOs only when directed by Commandant (G-SEA). Double heading of Air Force message ITCTOs will serve as direction for compliance. Notification of TCTO applicability will be via ACMS Maintenance Due Lists.

b. Reports and/or findings, when required, shall be forwarded to Commandant (G-SEA) vice the Air Force.

3. TCTOs accomplish special inspections or modification of aircraft. Modification/prototype of aircraft is only authorized by Commandant (G-SEA). All ideas for TCTOs shall be forwarded to Commandant (G-SEA) with a copy each to ARSC (Eng Div) and the appropriate Prime Unit. Figure 5-1. depicts a simplified Flow Diagram of the TCTO process. Refer to the TCTO Process Guide, CGTO PG-85-00-40, for additional information.



NOTE 1: COMMANDANT (G-SEA) WILL ASSIGN AN ENTITY (I.E., PRIME UNIT, ARSC, CONTRACTOR, ETC.) TO DEVELOP A DRAFT TCTO.

05001a

Figure 5-1. TCTO Origination and Production

a. Specific guidance for TCTO preparation is contained in Enclosure (3).

b. When a TCTO is amended, the revised TCTO is published in its entirety with all changes identified by revision bars. Amendments to existing TCTOs will be identified by the basic TCTO number followed by a sequential number depending on the number of times the directive has been amended. For example, the third amendment to TCTO 972020 would be CGTCTO 972023.

c. A TCTO master file will be maintained at each unit. It will be arranged utilizing ATA chapter numbers.

I. MONITORING TCTOS. The status of TCTO accomplishment must be a primary concern of all Engineering Officers. Quality control personnel should fulfill the TCTO program monitoring functions. Significant problems or potential delays in accomplishment that are detected by maintenance supervisors and quality control personnel must be brought to the immediate attention of the Engineering Officer for timely resolution. Final accomplishment of TCTOs is recorded in ACMS through MPC signoff. If the interval and compliance date are not listed on the ACMS Status Report for a specific aircraft, the unit must research that TCTO to determine its applicability and its last done date. Aviation materiel personnel must closely monitor the status of TCTO kits.

Table 5-1. Maintenance Publications Information

Aircraft Type	HC-130
Airframe Procurement Source	Lockheed
Publications and Status	USAF manuals supplemented by USCG T.O.s
List of Applicable Publications (LOAP)	TIMOS Master Publication Index
Maintenance Procedure Cards	ACMS Maintenance Requirements List
Component Replacement Interval	TO 1C-130A-6 and ACMS Maintenance Requirements List
Input Method for Correcting Publication Updating Responsibility	CG-22 and AF Form 847 ARSC
Aircraft Type	**C-4A/C-20B**
Airframe Procurement Source	Gulfstream Aerospace
Publications and Status	Gulfstream I and III commercial manuals
List of Applicable Publications (LOAP)	Index in commercial manuals (LOAP) plus Enclosure (4) for list of additional avionics publications
Work Cards	Computerized Maintenance furnishes work control cards
Component Replacement Interval	Computerized Maintenance Requirements List
Input Method for Correcting Publication Management Responsibility	Letter report to Grumman ARSC
Aircraft Type	**HU-25**
Airframe Procurement Source	Falcon Jet Corporation

Publications and Status	Commercial Manuals, CGTO numbers assigned
List of Applicable Publications (LOAP)	TIMOS Master Publication Index
Maintenance Procedure Cards	ACMS Maintenance Requirements List
Component Replacement Interval	ACMS Maintenance Requirements List
Input Method for Correcting	CG-22 and AF Form 847
Publication Management Responsibility	ARSC
Aircraft Type	HH-65
Airframe Procurement Source	Eurocopter, France
Publications and Status	Commercial Manuals, CGTO numbers assigned
List of Applicable Publications (LOAP)	TIMOS Master Publication Index
Maintenance Procedure Cards	ACMS Maintenance Requirements List
Component Replacement Interval	ACMS Maintenance Requirements List
Input Method for Correcting	CG-22 and AF Form 847
Publication Management Responsibility	ARSC
Aircraft Type HH-60	
Airframe Procurement Source	Sikorsky
Publications and Status	USN manuals and NA 4790.2 (Series)
List of Applicable Publications (LOAP)	TIMOS Master Publication Index
Maintenance Procedure Cards	ACMS Maintenance Requirements List
Component Replacement Interval	ACMS Maintenance Requirements List
Input Method for Correcting	CG-22 and AF Form 847
Publication Management Responsibility	ARSC

CHAPTER 6. PERSONNEL AND TRAINING

References:

1. Staffing Standards Manual, COMDTINST M5312.11 (series)

2. Personnel Resources Manual, COMDTINST M5312.13 (series)

3. Aviation Incentive Pays Management and Administration, COMDTINST M7220.39 (series)

4. Enlisted Qualifications Manual, COMDTINST M1414.8 (series)

5. Enlisted Qualifications Codes Manual, COMDTINST M1414.9 (series)

A. GENERAL. Commandant (G-SEA) is Program Manager for the three enlisted ratings in Coast Guard aviation (Aviation Maintenance Technician (AMT), Aviation Survival Technician (AST), and Avionics Technician (AVT)); Commandant (G-SRF) is responsible for the structure and content of these rates. In addition, Commandant (G-SRF) manages the initial training for Aviation Maintenance Officers. In managing training requirements for aviation, Commandant (G-SRF) works closely with Commandant (G-SEA), Commandant (G-WTT), the CG Training Manager, and Commandant (G-OCA), the operational program manager for aviation. A healthy personnel system meets job performance requirements, provides for a dynamic promotion system, and accommodates professional development goals. The primary tools of the personnel system in which Commandant (G-SEA) participates directly are Staffing Standards development, Rating Review, Quals Review, and the Aviation Training Plan. These processes are discussed in greater detail below.

B. PERSONNEL ALLOWANCES. Allocation of personnel resources is controlled by the Staffing Standards Manual and is communicated to units in the Personnel Allowance List (PAL). Requests for change to unit PALs must reference the Staffing Standards Manual and the Personnel Resources Manual, which contain policy and procedures on personnel resources.

C. FLIGHT ORDERS. Detailed guidance on management and reporting of flight orders for enlisted personnel is contained in the Personnel Manual and in COMDTINST M7220.39 (series).

D. PERFORMANCE QUALIFICATIONS. The performance qualifications are the foundation on which all staffing, training, and evaluations are developed. They describe the task elements to be performed at each rank level of a specialty. The aviation performance qualifications are reviewed and revised by Commandant (G-SRF) on a regular cycle with the assistance of the Training Manager, Commandant (G-WTT) and Workforce Planning, Commandant (G-WR-2). The qualifications review process is conducted in accordance with the Enlisted Qualifications Manual and is normally held in conjunction with the Rating Review which verifies rating and workforce structure. Field personnel are encouraged to participate in this process through the solicitation of board members.

1. Qualification Codes. Qual codes identify enlisted billets by specific skill and knowledge requirements and are assigned to eligible personnel following appropriate training and professional accomplishment. The most common aviation qual codes are those assigned at the completion of residential training and Aircrew qualification. They enable the Force Manager to project training requirements, improve personnel distribution, and optimize personnel utilization. Failure to accurately record qual codes severely impacts the ability of the Force Manager and CGPC-epm to manage the enlisted workforce. Descriptions of qual codes and the procedures for their assignment and revocation are found in the Enlisted Qualifications Codes Manual. It should be noted that many qual codes are not assigned by the training centers at course completion because there is often a demonstration period attached to the specific skills. In these cases, the parent unit must assign the qual code after adequate performance is demonstrated over a specified time period, and for all Aircrew qualifications.

E. TRAINING. Aviation training takes the form of residential training, nonresidential training and in-service delivery on-the-job training (OJT) methods. The acquisition of specialized skills is critical to the success of the aircraft maintenance effort.

1. Residential Training. Residential training available to Coast Guard aviation maintenance personnel ranges from introductory level apprentice courses to specific components or system

training. These schools are labeled Class "A," "B," and "C." Specific information on approved schools is contained in the Training and Education Manual. Quota control is provided by the Aviation Training Quota Manager at the Training Quota Center; training orders are normally issued by message.

a. Class "A" School. Aviation Class "A" School instruction is two tiered.

(1) Tier One: A 4 month (non-resident) Airman Program will be completed at air stations prior to attending resident Class "A" School. Completion of the Airman Syllabus is a prerequisite for all of the aviation Class "A" Schools. The Airman Program is outlined below in the In-Service Training Programs.

(2) Tier Two: Resident Class "A" School. Formal "A" School curricula is developed from the rating's E-4 Enlisted Performance Qualifications. This instruction concentrates on the facts, concepts, and principles supporting aircraft systems and is provided by the Aviation Technical Training Center (ATTC) in Elizabeth City, North Carolina. ATTC provides instruction for the ratings; Aviation Maintenance Technician (AMT), Aviation Survival Technician (AST), and Avionics Technician (AVT).

b. Class "B" Schools. These schools provide advanced training, normally at DOD facilities, for specific career fields (e.g., AVT "B" School).

c. Class "C" Schools. This title refers to a body of schools and courses designed to address specific components, systems, or processes and are intended for the experienced technician. They are taught at a variety of CG, DOD, and contractor sites.

2. Nonresidential Training. Nonresidential courses are utilized when performance objectives can be met without disrupting the normal work requirements of the individual member. Current courses address a wide range of professional and technical development requirements and are provided by a variety of CG, DOD, and contractor sources. Some courses are self-paced and have no testing component; others are time tracked with testing required. Information on specific nonresident course offerings may be obtained from the unit Educational Services Officer.

3. In-Service Training. In-service training is a command responsibility that continues the education process begun in residential and nonresidential formal training. The importance of a systematic and measurable training program cannot be overstressed. The characteristics of a successful in-service training program require that it be needs driven, that is, it addresses actual job performance requirements; and it must be consistently applied. Training opportunities take many forms, including formal training lectures, actual maintenance, informal counselling, and others. The Engineering Officer must ensure his/her personnel are provided instruction of sufficient quality and quantity to meet job performance requirements and professional development goals. To do this, the Engineering Officer must be familiar with aviation enlisted qualifications, training system capabilities, and required training listed in the Training and Education Manual. Commandant (G-SEA) will assist with the accomplishment of the in-service training effort through the publication of instructor criteria, standardized training plans, and periodic review of unit training requirements.

a. Airman Program. The Airman Program is a prerequisite to attending any Aviation Class "A" School and is covered by policy in COMDTINST M1500.10 and COMDTINST M1000.6. The objective is to prepare service members bound for Aviation Class "A" Schools in the basic practices of aircraft maintenance.

(1) Aviation "A" school eligible personnel will be transferred Permanent Change of Station (PCS) as Airman to an assigned air station approximately 4 months prior to an anticipated Class "A" School convening date. The Coast Guard Personnel Center (CGPC) shall issue PCS orders to personnel on the AMT, AST and AVT Rating List in time for them to arrive at their air station 4 months prior to their "A" School convening date. Airman will fill a Training Allowance Billet (TAB) at the unit while completing the Airman Syllabus. Assignment of Airman

by CGPC will be based on the projected needs of the service for third class Petty Officers.

(2) Airman shall be assigned to the Aeronautical Engineering Department with an experienced Petty Officer assigned as a mentor. The Engineering Administrative Division will be responsible for monitoring all Airman and will ensure progress is documented in the member's training record not later than the first week of every month. The Educational Services Officer shall enroll the member in the Coast Guard Institute's Airman Course and provide the Airman with a package of training materials. The Airman Course Training Package provides both unit and member with administrative guidance and sets the standards for successful completion of the program.

(3) All Airman are to be evaluated after 3 months at the unit by senior enlisted members of the Aeronautical Engineering Department. This evaluation shall include a review of the member's progress in the Airman Syllabus for potential completion prior to attending "A" School. Commandant (G-SRF), ATTC, and CGPC shall be notified of Airman not expected to complete the syllabus in the allotted 4 month training period. At this point, the Command must make a determination as to the individual's potential for aviation service. If applicable, the Commanding Officer must notify CGPC-epm by message of personnel disenrolled from the Airman Program. Upon completion of the Airman Program, units must notify the Aviation Force Manager, Commandant (G-SRF), for placement on the assignment list for a convening "A" School class.

b. Apprentice Program. The objective of the Apprentice Program is to accelerate and formalize the processes by which aviation "A" school graduates acquire the skills necessary to effectively maintain the Coast Guard's aircraft systems. The Apprentice Program is a natural compliment to aviation "A" school instruction and the Airman Program. While aviation "A" school instruction concentrates on the FACTS, CON-CEPTS and PRINCIPLES surrounding aircraft systems, the Apprentice Program is designed to promote the practical application of that knowledge in completing the PROCESSES and PROCEDURES involved in aircraft systems maintenance. Essentially, the Apprentice Program is completing the E-5 Performance Qualifications for the rating as detailed in COMDTINST M1414.8 (series). Since the E-5 Performance Qualifications closely match the day to day work (remove, repair, replace) involved in maintaining Coast Guard aircraft, it is essential that new "A" school graduates quickly and successfully complete the Apprentice Program. As the Coast Guard enlisted advancement system is heavily weighted on the expertise detailed in the rating performance qualifications, this program establishes a 5 month no y period for the Apprentice to concentrate on their specific rating requirements.

(1) All new Third Class Petty Officers will enter the Apprentice Program on their arrival at the air station. Members will remain in the Apprentice Program until completion of all E-5 Performance Qualifications. Members may not begin the ying portion of their Aircrew Syllabus before serving at least 5 months as an Apprentice (5 month no y period) and the member can not progress past the Basic Aircrew position while serving as an Apprentice.

(2) A MENTOR will be assigned to each member entering the Apprentice Program. Mentors will be E-6 or senior E-5s of the same rating and with a minimum of 5 years time in rating. Mentors will be responsible for ensuring that all apprentice training is in accordance with Commandant Instructions. Mentors will provide a written monthly report to the Apprentice's supervisor. Reports will consist of the Apprentice's progress in the areas of performance accomplishments, quality of work, using resources, loyalty, stamina and professional knowledge. Figure 6-1. is a copy of the report which also aids in documenting performance for marking period evaluations. The Engineering Leading Chief will be responsible for monitoring the progress of personnel in the Apprentice Program.

(3) Members who quickly adapt and show strong progress in the Apprentice Program should be marked as "recommended for SWE." Otherwise, members should be evaluated as either "progressing" or "not recommended for SWE" on their semiannual Evaluation Report. Since time in grade for E-4 is only 6 months, it is imperative that supervisors send a correct signal to the member with the first and subsequent Evaluation Reports.

(4) A Journeyman Technician certificate will be awarded to personnel who successfully complete the Apprentice Program. The Engineering Leading Chief must submit a completion letter to Commandant (G-SRF) requesting a Journeyman Technician designation for the member. Figure 6-2. is a copy of the Apprentice completion letter. Personnel who fail to complete the Apprentice Program by the end of their second enlistment (approximately 8 years time in service) should not be recommended for reenlistment. Commanding Officers will determine if the member has had sufficient time to finish the program.

(5) Advanced Class "C" School training, i.e., Roto-Tuner, Composite Repair, is reserved for the Journeyman Technician. Members in the Apprentice Program should not be recommended for advanced Class "C" Schools. Members in the Apprentice Program may, however, attend aircraft specific Class "C" Schools, i.e., HH-65A Airframe and Power Train, HU-25 Avionics.

(6) Unit Engineering Departments are required to periodically review and revise their Apprentice Training Program to meet the ever changing needs of the new Third Class Petty Officers and ensure the long term health of the aviation enlisted workforce. Accomplish the mission, take care of our people, and grow new leaders; the Apprentice Program is rooted in all three principles of leadership.

4. Aircraft Maintenance Officer Training. Each year, Commandant (G-SEA) selects Maintenance Officer candidates using a formal selection board sponsored by CGPC-opm. Candidates are transferred PCS to an air station to complete an Aircraft Maintenance Officer qualification syllabus. After approximately a 1 year training program, graduates can expect assignment to appropriate maintenance officer positions at field units. Commandant (G-SEA) maintains a formal Maintenance Officer training syllabus which provides for resident and in-service instruction on a variety of practical maintenance subjects; syllabus information may be obtained by contacting the Program Manager at Commandant (G-SEA). The format for application and schedule of board convenings are contained in the Training and Education Manual.

5. Advanced Education. The Office of Aeronautical Engineering has requirements for highly specialized skills in key positions throughout the organization. To support these requirements, Commandant (G-SEA) sponsors several unique advanced education opportunities for qualified individuals seeking to enhance their contributions to the organization.

a. Maintenance Technician Advanced Education. Commandant (G-SEA) and Commandant (G-SRF) sponsor advanced (college level) education programs for the enlisted workforce (E-5 through E-7) in Aviation Maintenance Technology (AMT rating) and in Advanced Computer and Electronics Technology (AVT rating). Graduates of these programs can expect assignments to appropriate positions at either ARSC, ATTC, or a Prime Unit. Target applicants are highly competent senior E-5s and E-6s. These are 2 year programs leading to either an Associates or Bachelors Degree. Acceptance into the program obligates the member to an additional 6 years of service as 3 years of obligated service is incurred for each year of education. Application requirements and the selection process is further detailed in COMDTINST M1500.10 (series), the Training and Education Manual.

b. Engineering Officer Advanced Education. Commandant (G-SEA) sponsors Masters level educational programs in Aviation Engineering Administration, Aeronautical Engineering, Project Management, and Operations Research. Graduates of Commandant (G-SEA) sponsored programs can expect assignment to appropriate positions at

ARSC or the Office of Aeronautical Engineering. Particulars of the advanced education selection process and timing of boards are contained in the Training and Education Manual and the appropriate advanced education application solicitation messages.

6. Unit Training Plan. Units may submit a request for annual training quotas to Commandant (G-SRF) on the Class "C" School Training Report using the Aviation Unit Training Plan (AUTP) format. Commandant (G-SRF) will coordinate the submission of a combined request to Commandant (G-WTT) for the Aviation Training Quota Manager. Commandant (G-SRF) will provide Commandant (G-WTT) training allowance information for the formulation of individual unit training allowances. Any nonrecurring requested quota in excess of the established training allowance must be fully justified in a request to Commandant (G-SRF). The unit AUTP must indicate training required to meet authorized unit training allowances.

7. Aviation Technical Training Advisory Committee (ATTAC). ATTAC is charged with providing customer and field level input to Commandant (G-SRF) in the oversight of the aviation workforce training issues. ATTAC is composed of experienced aircraft maintenance officers and subject matter experts of the three rates drawn from the field; permanent representatives from Commandant (G-SEA), Commandant (G-WTT), CGPC-epm, TQC, and ATTC are included. Meetings are scheduled twice a year by Commandant (G-SEA). ATTAC services are conducted in accordance with the ATTAC Process Guide. Specific information on ATTAC composition, meeting schedule, and agendas may be obtained from Commandant (G-SRF) and COMDTINST 13020.2A, Aviation Technical Training Advisory Committee.

Apprentice Monthly Progress Evaluation

Coast Guard Air Station _____ Date: _____

Mentor: _____ Apprentice: _____ Supervisor: _____

Unsatisfactory: Apprentice not performing to minimum standard for time in rate, unable to demonstrate basic proficiency of job requirements.

Progressing: Apprentice is making progress toward completion of requirement of Apprentice Program.

Satisfactory: Apprentice has background and skills to perform assigned duties and complete requirements for Apprentice Program.

Accomplishments: Examples – completion of E–5 Performance Qualifications, ACMS Cards, CG–4377 maintenance signoffs and Basic Aircrew.

Aircraft Knowledge

__ Unsatisfactory: Marginal or poor understanding of basic aircraft systems.
__ Progressing: Demonstrates a knowledge of aircraft systems and routine rating concepts.
__ Satisfactory: Good knowledge of aircraft systems, able to analyze and solve system difficulties.
Accomplishments: _____

Quality of Work

__ Unsatisfactory: Poor quality, components installed incorrectly, often requires redoing, constant supervision required.
__ Progressing: Applies previous training and experience to produce quality work.
__ Satisfactory: Quality work performed, takes time to excel, minimal guidance required.
Accomplishments: _____

Using Resources

__ Unsatisfactory: Wastes time, poor understanding of procedures, improper use of tools, publications, and ACMS cards.
__ Progressing: Requests help from others, able to use publications and tools correctly.
__ Satisfactory: Seeks out others to increase personal knowledge and skills, uses initiative to accomplish task.
Accomplishments: _____

Safety

__ Unsatisfactory: Disregard for hazard to self and others, fails to use safety equipment (PPE) or follow standard procedures.
__ Progressing: Usually practices safety, follows instructions when visible.
__ Satisfactory: Safety conscious, consistently follows correct safety procedures in performance of all tasks.
Accomplishments: _____

Stamina

__ Unsatisfactory: Performance and productivity decreases during periods of extended work, resists overtime.
__ Progressing: Works overtime to complete assigned task.
__ Satisfactory: Willingly works additional hours to complete tasks, volunteers to work overtime to acquire knowledge.
Accomplishments: _____

Working with Others

__ Unsatisfactory: Disorganized and disregards ideas and instructions of others.
__ Progressing: Listens and learns from others, accepts share of work.
__ Satisfactory: Can–do player, works effectively with others to achieve completion of assigned tasks, carries share of work.
Accomplishments: _____

Figure 6-1. (Sheet 1 of 2)

Apprentice Monthly Progress Evaluation

Loyalty

__ Unsatisfactory: Often complains, outwardly shows lack of commitment to CG aviation, aircraft maintenance, and shipmates.

__ Progressing: Showing pride in work, helps shipmates and respectful of seniors.

__ Satisfactory: Personal actions exhibit pride in work and CG, consistently supports Command, seniors, and shipmates.

Accomplishments: _____

Comments: _____

_____

_____

_____

Figure 6-1. (Sheet 2 of 2)

Apprentice Monthly Progress Evaluation

U.S. Department of Transportation
United States Coast Guard

Commanding Officer
United States Coast Guard
Air Station Sacramento

Sacramento, CA
95652-1260
Phone: (916) 643-2796

1520

From: Commanding Officer, Coast Guard Air Station Sacramento
To: Commandant (G-SRF)
Via: Commandant (G-SEA)

Subj: COMPLETION OF AVIATION APPRENTICE PROGRAM

Ref: (a) Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1
(b) Enlisted Qualification Manual, COMDTINST M 1414.8

1. AMT3 John J. Doe 999 55 1234, USCG has successfully completed the Aviation Apprentice Program as outlined in reference (a) and desribed below:

a. Tier One: Airman Program completed at Air Station Sacramento on 15 August 1998.

b. Tier Two: AMT A-School successfully completed on 7 February 1999.

c. Tier Three: AMT2 Performance Qualifications as outlined in reference (b) successfully completed on 20 July 1999. AMT3 Doe holds the Basic Aircrew Certification in the HC-130.

2. Request that AMT3 Doe be designated an Aviation Journeyman Technician. AMT3 Doe has consistently demonstrated the technical skills and expertise to contribute to this unit's Aviation Engineering Maintenance Program.

Commanding Officer

Figure 6-2. Apprentice Letter of Completion

CHAPTER 7. AVIATION SUPPLY SUPPORT

A. GENERAL. The procedures addressed in this chapter reflect current inventory management as it impacts all of Coast Guard aviation. This chapter brings together policies and procedures specific to aviation. Further guidance can be found in these manuals.
- Comptroller's Manual - COMDTINST M4400.13 (series)
- Supply Policy and Procedures Manual - COMDTINST M4400.19 (series)
- AIRLOG Messages

B. SEEKING ASSISTANCE. Contact the offices listed below for assistance with AMMIS or logistics information:

ASSISTANCE REQUIRED	OFFICE	TELEPHONE NUMBER
Technical Help for	AMMIS AMMIS Help Desk	(919) 335-6793/5261
Logistics Information	Data Management Staff	(919) 335-6280
Materiel Requests	Operations Duty Officer	(919) 335-6289

C. AIRLOG MESSAGE SYSTEM. Aviation Logistics (AIRLOG) messages provide policies and procedures relevant to all air units. These messages are numbered consecutively for each fiscal year. Each unit shall maintain these messages as official directives.

D. LOGISTICS COMPLIANCE INSPECTION (LCI). The LCI team is comprised of members from Commandant (G-SEA) and ARSC who inspect the internal processes required to complete the maintenance support function. LCIs provide a critical look at all aspects of engineering, logistics, and maintenance management functions. These inspections provide Headquarters and the unit valuable information about the health of that stations' engineering and logistic functions. See Enclosure (2) for the LCI Worksheet and paragraph 1.P. for additional details.

E. DEFINITIONS. These definitions are used throughout this chapter and are common in logistics circles:

NOTE

The terms A Condition, RFI, and serviceable are used inter-changeably. The terms F Condition, NON-RFI, unserviceable and class 265 are used interchangeably. The preferred terms are serviceable and unserviceable.

CODE	TITLE	DEFINITION
A Condition (also referred to as RFI)	Serviceable (Issuable Without Qualification)	New, used, repaired, or reconditioned materiel which is serviceable and issuable to all customers without limitation or restriction.
F Condition (also referred to as either class 265 or NON-RFI)	Unserviceable (Reparable)	Economically reparable materiel which requires repair, overhaul, or reconditioning.

F. MATERIEL TYPES. Aeronautical and avionics materiel managed by Aviation Inventory Control Point (AICP) Elizabeth City, is divided into six "type" classifications according to price and/or source to determine the kind of control that will be used in its management.

1. Specific Types. Specifically, materiel types used in USCG aviation supply support are described in the following paragraphs:

   a. Type 1. The aeronautical materiel under individual (serial number) management by ARSC is defined below. Items classified as Type 1 materiel are listed in Enclosure (7).

      (1) Aircraft Engines.

      (2) High Value Components. Extremely high value components such as HH-60 main gearboxes and selected avionics components.

      (3) Special Configuration Control. Items requiring special configuration control procedures.

      (4) Critical Supply. Items in critical supply and of sufficiently high cost and low volume that require individual management such as HH-60 APUs.

   b. Type 2. Aeronautical materiel, less avionics, for which ARSC has service-wide support responsibility. To qualify as Type 2 materiel, one of the following conditions must be satisfied:

      (1) Unit Price. A unit price of $250 or more.

      (2) Coast Guard Peculiar Materiel. USCG peculiar materiel regardless of unit price.

      (3) Ground Support Equipment (GSE). GSE specifically identified in Aircraft Materiel Allowance List.

      (4) Procurement Problems. Materiel difficult to procure at unit level regardless of unit price, i.e., long lead time.

      NOTE

      If an item less than $250 appears in the Type 2 section of the Allowance List it has qualified as difficult for unit level procurement or CG peculiar.

   c. Type 3. Aeronautical materiel, less avionics, with a unit cost less than $250 and easily procurable from Other Government Agency (OGA) or a commercial source. Units set their own allowance quantities and procure materiel using unit AFC 30 funds.

   d. Type 4. Avionics materiel that is either reparable or has a unit cost of $800 or more. ARSC has inventory management and unit support responsibility for Type 4 materiel.

   e. Type 5. Consumable avionics materiel with a unit price less than $800. Aviation units obtain Type 5 materiel from Coast Guard ELC, OGA, or a commercial source using unit AFC 30 funds.

   f. Type 6. Ground Support Equipment (GSE). No unit held spares are authorized. GSE replacement requires a board of survey and should be coordinated with the GSE item manager.

2. Flow Diagram. The ow diagram (Figure 7-1.) indicates how materiel moves through the supply system.

   a. Initial Provisioning Package. Each new unit or existing unit receiving a new model aircraft receives a site staging package or initial provisioning package consisting of all materiel for the new aircraft model(s), including Types 1, 2, 4, and 6. Units will be responsible for the purchase of Type 3 and 5 materiel with unit funding. Additionally, certain large ground support equipment items may be purchased by ARSC.

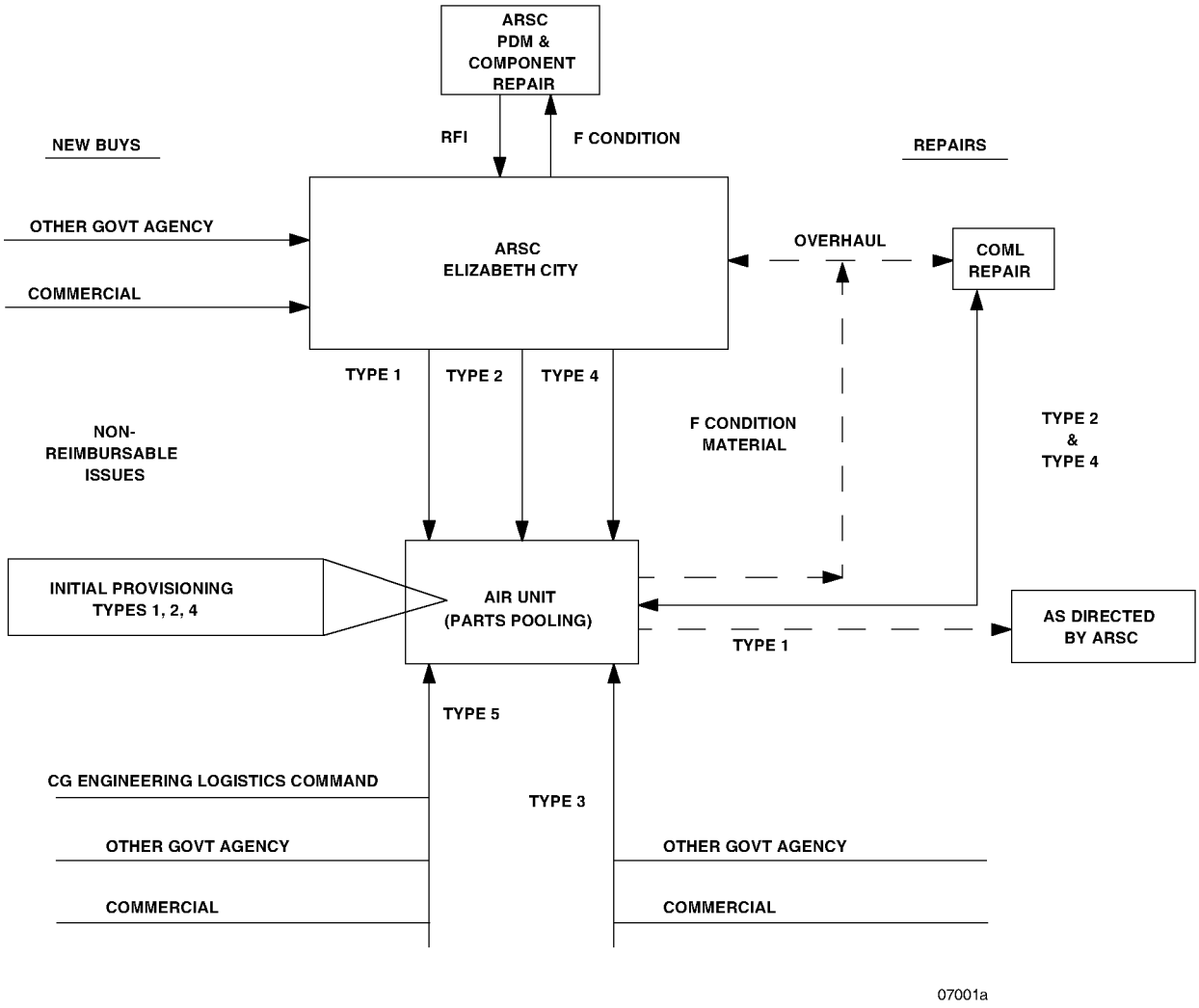


Figure 7-1. Supply Support-Materiel Flow

b. Subsequent Type 1 Materiel Transactions. Subsequent Type 1 materiel transactions are controlled by ARSC. Type 1 materiel transactions shall be reported by routine message to COGARD ARSC ELIZABETH CITY NC.

(1) Type 1 Materiel Receipt. Report receipt of Type 1 materiel by routine message with the following information:

NOTE

Materiel must be receipted for in AMMIS in addition to the message.

(a) Part Number

(b) Serial Number

(c) Receipt Date

(d) Requisition that applies (if known)

(e) Name and phone number of Point of Contact (POC)

(2) Type 1 Materiel Removal. Report Type 1 removal by routine (or priority message if requesting immediate replacement) message whenever Type 1 materiel is removed for unscheduled maintenance (unit reparable) or is classified as unserviceable. The message will include the following information:

NOTE

Materiel must be requisitioned in AMMIS in addition to the message.

(a) Part Number

(b) Serial Number

(c) Time since new and time since overhaul

(d) Reason for removal or classification as unserviceable

(e) Unsatisfactory report number (if appropriate)

(f) Serial Number of replacement

(g) Estimated date of return to serviceable (if repaired locally)

(h) Remarks, i.e., request replacement (state priority) and disposition instructions

NOTE

If the Type 1 removal is for the LTS-101 HH-65 engine, include the following information:

(i) Date and time Textron-Lycoming was notified

(j) POC at Textron-Lycoming

(k) Disposition provided by Textron-Lycoming (field repair/depot)

(3) Unserviceable Type 1 Materiel Returned to Serviceable. Whenever Type 1 materiel has been repaired locally and returned to serviceable status, it shall be reported by routine message with the following information:

(a) Part Number

(b) Serial Number

(c) Status Data

NOTE

Engines removed solely for the purpose of routine inspection need not be reported unless difficulties are encountered which would require assistance beyond unit capabilities.

(4) Shipping Instructions. Unserviceable, Type 1 materiel shall be expeditiously preserved and prepared for shipment. Upon receipt of the message in (2) above, ARSC will issue orders for shipment to the designated overhaul/repair point. Type 1 materiel shall be shipped as soon as practical but not later than 15 days following receipt of shipping orders. Report by routine message with the following information:

(a) Part Number

(b) Serial Number

(c) Shipping data (date, mode of transportation, Government Bill of Lading (GBL) number)

(5) Transfer of Type 1 Materiel. Occasional transfer of Type 1 materiel between units is necessary. Orders for shipment will be issued by ARSC and shipment will be effected within 24 hours of receipt of message. A routine message shall be sent to ARSC (info: Receiving District, Receiving Unit) with the following information:

NOTE

All materiel movements require appropriate transactions in AMMIS to ensure asset visibility is maintained.

(a) Part Number

(b) Serial Number

(c) Shipping data

[1] Government Bill of Lading (GBL) number

[2] Name of carrier

[3] Origination and date of shipment

[4] Destination of shipment

(6) Requisitioning. Distribution of serviceable Type 1 materiel for stocking as spares at operating activities is controlled by ARSC.

c. Subsequent Types 2 and 4 Materiel Transactions. Subsequent Type 2 and Type 4 materiel transactions are handled in the following manner: the Allowance List prescribes the content and quantity of materiel a unit may stock; replacement materiel is requisitioned from ARSC, at no cost to the unit, via AMMIS; unserviceable reparable materiel is returned to ARSC using the AMMIS generated NON-RFI turn-in document.

d. Subsequent Types 3 and 5 Materiel Transactions. Subsequent Types 3 and 5 materiel is requisitioned using unit funds. Procurement of additional materiel and designation of stocking levels for Types 3 and 5 materiel are decisions made by unit managers.

e. GSE Materiel Transactions. Allowance levels for Ground Support Equipment (GSE) are found in AMMIS and in enclosures (11) through (15) of this manual. Adjustments to the allowances are made via AMMIS for those listed there. Changes for items listed in the enclosures shall be requested by letter to the Commanding Officer of ARSC. Include clear justification for the proposed changes. GSE normally has a long procurement lead time so good planning is a must. GSE materiel not found in the Allowance List or in the manual shall be purchased with unit or district AFC 30 funds.

G. MATERIEL REQUISITIONING PROCEDURES.

1. Priority Assignment. Priority assignment is an important part of the requisitioning process. The procedure for selecting a priority is governed by the Uniform Materiel Movement and Issue Priority System (UMMIPS). In general, USCG Headquarters and air stations are assigned a Force/Activity Designator of II, while ARSC, ATTC, and ATC Mobile are assigned a Force/Activity Designator of III.

	A	B	C
II	02	05	12
III	03	06	13

NOTE

More specific definitions can be found in the Supply Policy and Procedures Manual, COMDTINST M4400.19 (series).

2. Source of Supply. ARSC is the supply source for all Types 1, 2, 4, and 6 items appearing in the Aircraft Materiel Stocking List.

3. Requisition Procedures. Materiel is requisitioned through one of two channels.

   a. From ARSC. Type 1, 2 and 4 materiel requisitions are submitted directly to ARSC via AMMIS. For non-allowance materiel or any other instance where "Remarks" are required, enter an identifier code AOE (for exception orders, order by part number) requisition through AMMIS.

   b. From Other Sources. Automated Requisition Management System (ARMS) or Simplified Uniform Requisitioning Format (SURF) procedures are used to order from Government supply sources.

4. Requisition Processing. After a valid requisition is received in AMMIS, the required materiel is either released for shipment or, if sufficient materiel is not in stock, the requisition is placed in a backorder queue according to its priority and date-time-group.

5. Processing Receipts for Materiel Shipped to Field Units. When materiel is ordered from ARSC and is in the ARSC inventory, it will be shipped to the ordering unit. High priority requisitions and a safety stock may preclude immediate filling of lower priority requisitions. Priority 2 requisitions are selected for immediate shipment. Priority 5 and 12 requisitions are evaluated once per day for subsequent shipment. When materiel is ordered from ARSC and is not in the ARSC inventory, it will be ordered from the appropriate Government agency or commercial vendor. This materiel may be direct shipped to the ordering unit from the Government source of supply or commercial vendor. In these cases, after the materiel is shipped to the ordering unit, ARSC is billed for payment. The Prompt Payment Act requires that these invoices be paid within 30 days of receipt of materiel, or interest must be paid to vendors. ARSC cannot make payment unless the ordering unit acknowledges receipt of materiel. Acknowledgment of receipts will be made via AMMIS. It is essential that field units notify ARSC of receipt of direct shipment.

6. Receiving Inspection of Aviation Materiel. All aviation materiel received by the Air Station shall be inspected upon receipt. If the materiel is serial number tracked by ACMS, supply personnel shall ensure that the materiel has proper documentation and is currently enrolled in ACMS. If the materiel is not enrolled, it will be enrolled at the time of receipt. All materiel will be inspected for obvious defects, leaks, unserviceable indications, lack of a serviceable tag, etc. Any part with questionable background, or whose condition is suspect, will be brought to the attention of the Engineering Officer. The Engineering Officer will determine whether the part is serviceable or unserviceable. Any questions concerning the condition of the part will be brought to the attention of the appropriate ARSC Technical Services Branch.

7. Type 1 Materiel. Type 1 materiel is requisitioned via AMMIS. The Type 1 message is a secondary alert to ARSC personnel to ensure appropriate action is taken in the absence of the Inventory Manager. Unless the shipping and reporting procedures are closely followed, the spares on hand will not be sufficient to prevent NMCS conditions.

8. Parts Pooling. The decision to parts pool rests with the aircraft Product Line staff at ARSC. ARSC will provide a local order number to be included in the manifest to trigger a document number swap. If required, a requisition is initiated to replace materiel at the supplying unit. The receiving unit must receipt for the materiel via AMMIS and is responsible for any unserviceable materiel turn-in.

NOTE

All parts pool packages require AMMIS processing and shall be marked clearly with:

CG Aviation Parts Pool
Document Number: (Gaining Unit Document Number)

H. CHANGE-KIT CONTROL PROGRAM.

1. General Information. ARSC controls TCTO change kits. To maintain accountability, both ARSC and operating activities must apply the following procedures to the USCG TCTO change kit program:

   a. The need for kits and their applicability will appear in the TCTO.

   b. Only unit-level incorporation kits will be issued to operating activities. PDM level incorporation kits will be shipped directly to the appropriate PDM facility.

   c. Units will be issued kits with the TCTO for applicable aircraft. The following general guidelines shall apply, unless safety-of- flight considerations or TCTOs dictate otherwise:

      (1) Kits requiring more than 4 man-hours for incorporation will not normally be issued within 4 months of the scheduled aircraft PDM induction date.

      (2) Kits requiring 4 or less man-hours for incorporation will not be issued within 45 days of scheduled aircraft PDM induction dates.

   d. Kits will be supplied for a specific aircraft or system. The kit will be labeled with the aircraft/engine serial number upon issue and will not be installed in a different serial numbered aircraft/engine without approval from ARSC. Uninstalled change kits for a specific aircraft/engine will accompany that aircraft on all ferry missions until incorporated. TCTO change kits for spare components will be supplied as above except the letters "SPAR" will be used in lieu of aircraft/engine serial number. Kit disposition instructions for strike damage aircraft and information on other kit accountability problems must be obtained from the appropriate aircraft Product Line staff at ARSC.

   e. Kits will be packaged with distinctive kit markings to identify them to supply and maintenance personnel as a kit.

I. STANDARD (REPARABLE UNSERVICEABLE) MANAGEMENT SYSTEM.

1. Reparable Cycle. Aeronautical and avionics materiel (except Type 1), removed from service and classed as unserviceable, is processed as follows:

   a. Preservation, Packaging, and Tagging. Unserviceable materiels must be preserved, packaged, and tagged at the unit with DD-1577-2 for unserviceable items or CG-1577-A for unserviceable items with an Unsatisfactory Report. Ensure that the DD-1577-2 or CG-1577-A is filled out completely. Hazardous materiel shall be individually packaged and the container clearly marked as to the hazardous contents. Refer to COMDTINST M4610.5 for specific packaging, marking, and shipping information.

NOTE

Incomplete or illegible tags increase processing time and reduce availability resulting in increased leadtime and non availability of serviceable assets.

NOTE

DO NOT use wire for tagging equipment. Twine or other soft

materiel shall be used to eliminate damage during handling.

   b. Component Documentation. Accurate component documentation is critical to proper asset management and is directly related to aircraft availability. Commanding Officers shall ensure that the following procedures are strictly adhered to: (1) Ensure an updated ACMS Significant Component History Report (SCHR) is included with components which require an SCHR. Additionally, a current ACMS

Configuration Report must be included with those components listed on the ACMS Configuration Report as next higher assembly. Units shall compare the Configuration Report, SCHRs, and actual component serial numbers, routinely, prior to shipment.

(2) Ensure a fault printout or statement of CTS-81 inoperability is included with equipment tested on the CTS-81.

c. Shipping. Materiel shall be shipped to ARSC or other designated repair facility with the appropriate documentation within 15 days of removal from service. Foam-in-place equipment should be procured and utilized to protect high cost components from shipping damage.

NOTE

Many items are shipped from ARSC in reusable containers. These containers are designed to provide the greatest amount of protection during shipment. Maintain and reuse these containers. Materiels damaged in shipment which are not properly packaged create increased cost and decreased availability.

NOTE

Containers should be appropriately marked, especially when fragile equipment is involved (i.e., FRAGILE - HANDLE WITH CARE).

d. Screening. Screened by ARSC for P/N, NSN, and condition (economical for repair).

e. Stocking. Stocked in an unserviceable condition at ARSC.

f. Withdrawal. Withdrawn in economicsized lots for repair/overhaul at ARSC, USN/ USAF rework facilities, commercial firms, or for exchange with USN/USAF for equivalent serviceable items.

g. Return/Direct Shipments. Returned from repair/overhaul to ARSC stock as serviceable materiel or direct shipped to air stations.

h. Restocking. Serviceable materiel restocked at units to fill allowances.

2. Elements of the Cycle. To function smoothly, the reparables cycle must conform closely to the planning parameters used in selecting the number of reparables needed to keep the pipeline full. Specifically these are, for the example of a generator, as follows:

a. Number of Generators Installed. If a particular aircraft type uses 2 generators, and we have 40 aircraft, we obviously start with 80 generators required.

b. Pipeline Spares. The "pipeline" can be described by the five steps in paragraph 7.I.1. Assume we have 10 units operating the aircraft in question and know the allowance quantity, days required to process and ship an unserviceable generator, shipping time from various units, repair lot size considered economically justified, overhaul/repair time, shipping time back to ARSC, and shipping time to various units. We can do computations or run a computer simulation to determine the number of spares required to preclude several "probabilities" of having shortages.

c. Scrap-Out Rate. Using past history, manufacturer's data, and engineering studies, we can predict an annual percentage of the total number of generators that will be uneconomical to repair for various reasons.

3. Operation. For example, if we assume that we bought 80 generators to be installed, 40 for pipeline spares, and 12 more to anticipate the scrap out rate of 5 percent for each of the first 2 years, we would have 132 generators in the inventory. Initially, 80 would be installed, 20 would be on 10 airunit shelves or enroute and 32 would be at ARSC. At the end of 2 years we would expect to have 80 installed, 20 at units, and 20 in the repair pipeline. Engineering

officers have a direct impact on the number of items in the pipeline; delays in returning materiel to ARSC disrupt the reparables in the following manner:

a. Loss of Reparable Assets. If an item classed as reparable is disposed of from lack of knowledge at the shop level or other mistake, a reparable item is lost and the scrapout rate is affected.

b. Forecasts. Forecasts are made by ARSC every 6 months concerning the number of generators (in this example) needed to support the 40 aircraft and 10 units. If the quantity needed is less than the serviceable quantity, arrangements are made to overhaul the remainder at some overhaul activity. Forecasts are also made of unserviceable returns to ARSC and economic lot sizes are contracted for. Delay in returning unserviceable generators to ARSC for overhaul prevents ARSC from fulfilling its contractual obligations. Not only do serviceable generators fail to come out the end of the pipeline, but fiscal year funds projected for generator overhauls may be lost.

c. NMCS Conditions. NMCS conditions eventually result when insufficient reparables are received from units. Generators cannot be overhauled until they arrive at the overhaul facility.

d. Overstock Conditions. Overstock conditions result when ARSC procures new generators to meet current requirements and then receives overdue unserviceable assets from units. Funds that could have been used to procure other necessary spares are tied up in excess generators.

4. Solutions. Maintenance personnel can greatly improve the operation of the reparable cycle by performing the following:

a. Screen Inoperative Components. Carefully screen inoperative components to determine if repairs can be made locally.

b. Provide Specific Information. Provide specifics on the Unserviceable tag (CG-1577-A or DD-1577-2).

c. Attach SCHRs. Ensure SCHRs are attached for all components which require an SCHR and accurate configuration reports for assemblies.

d. Clearly Identify Reparables. Assure that documentation for reparables is clearly identified to prevent disposal of reparable assets.

e. Quick Return of Reparables. Reparables shall be returned to ARSC or ARSC directed repair facility within 15 days of removal from service.

f. Periodic Inspection of Shop Areas. Make routine inspections of shop areas to locate unauthorized serviceable spares and forgotten unserviceable assets.

g. Check for Excess Serviceable Materiel. Urge supply personnel to make frequent checks for excess serviceable materiel and weekly checks for unserviceable items. (Remember, your excess serviceable is your counterpart's NMCS materiel and your on-board unserviceable assets will eventually increase your NMCS rate.)

5. Procedures.

a. When a unit submits a valid requisition to ARSC for a serviceable reparable item, the following will occur:

(1) A due-in from the unit to ARSC for an unserviceable item will be established on AMMIS.

(2) A NON-RFI turn-in document for each item will be computer generated. This document will carry the same document number as the serviceable item document number.

(3) Turn-in documents will be transmitted to aviation units each workday.

(4) The unit may query AMMIS to determine their unserviceable due-ins at anytime utilizing the report function in "Generate Cumulative Turn-in Report."

(5) Computer generated NON-RFI turn-in documents or screen prints of NON-RFI from maintenance turn-ins may be used to turn in unserviceable parts. (See exceptions paragraph 7.I.5.c.)

NOTE

When returning RFI reparable items to ARSC, utilize the same AMMIS procedures used for NON-RFI items. Write "RFI" on the AMMIS document in bold print. When returning RFI consumable materiel ensure that it is individually packaged and properly identified with the NSN, P/N, and nomenclature. If consumable materiel cannot be identified at the unit level, the unit should dispose of the materiel locally. DO NOT send unidentified materiel to ARSC.

b. When a unit receives an RFI reparable part from ARSC, the following should occur:

(1) Establish a file of NON-RFI turn-in documents.

(2) Monitor unserviceable items in maintenance for over 15 days utilizing the Cumulative Turn-In Report in AMMIS. If the unserviceable item has not been received in supply for shipment, initiate action to determine the item's status. Units shall expedite shipment of components and not cause shipment delays by waiting to multi-pack these items. Aviation units will be allowed a maximum of 30 days from date of failure of the part to date of shipment to ARSC for handling of unserviceable materiel. Local procedures shall be instituted to ensure this handling requirement is met. Priority should be given to critical components and components valued in excess of $1500.

(3) Ship the unit to ARSC with one copy of the AMMIS generated NON-RFI document attached to the part.

(4) Engineering and/or Supply Officers shall review the CO's reports in AMMIS to ensure assets are being turned in expeditiously and properly.

c. Exceptions:

(1) Each NON-RFI turn-in document must be returned to ARSC to clear the account. Air stations may contact the NON-RFI control clerk if difficulties are experienced in this process.

J. MATERIEL PRESERVATION. The fundamental principles and approved methods and techniques used in the protection of supplies and equipment against deterioration and damage during shipment and storage are contained in the following generic publications. They shall only be used when such procedures are not addressed in applicable ACMS MPCs or component maintenance manuals.

NUMBER	TITLE
1. NAVSUP PUB 502	Preservation, Packaging, and Packing of Military Supplies and Equipment, Vol. I
2. NAVSUP PUB 503	Preservation, Packaging, and Packing of Military Supplies and Equipment, Vol. II
3. NA 15-01-500	Preservation of Naval Aircraft
4. NA 15-02-1 (T.O. 2-1-32)	Aircraft Engines and Auxiliary Power Units

NOTE

The above publications may be ordered using the TIMOS program.

K. ALLOWANCE CHANGE REQUESTS.

1. General Information. Allowance Change Requests (ACR) are submitted through AMMIS. The ACR is processed through the appropriate Product Line. The Air Station may query AMMIS to determine the status of an ACR and has the capability to print the allowance listing utilizing the MANAGE ALLOWANCE LIST MENUS screen 'as40000' in AMMIS.

L. AUTHORIZED CHEMICAL USE LIST.

1. General Information. The Authorized Chemical Use List is a complete list of chemicals (greases, oils, paints, sealants, etc.) necessary to maintain each aircraft type. Use of particular chemicals is managed jointly by the ARSC Industrial Systems Manager (ISM) and the applicable ARSC Engineering Technical Services Branch.

2. Applicability. The provisions of this section apply to each aircraft with an Authorized Chemical Use List contained in Chapter 00 of the ACMS MPC deck.

3. General Requirements. Only those chemicals contained on the list may be procured or stocked by the engineering department for use on the designated aircraft type.

4. Requesting Changes to the Authorized Chemical Use List. Coast Guard form CG-22 shall be used to request Authorized Chemical Use List changes. The CG-22 will be routed through the applicable Prime Unit to the Industrial Systems Manager (ISM) for approval.

5. Interim Changes to the Authorized Chemical Use List. Air Station Engineering Officers may authorize a one time purchase of chemicals not contained on the Authorized Chemical Use List to meet operational commitments. Air Station Engineering Officers shall coordinate one time use with the applicable ARSC Engineering Technical Services Branch, specifying the need and application of the proposed chemical.

6. Prototyping of Chemicals.

   a. Prototyping of chemicals used on Coast Guard aircraft or systems must be approved by the ISM prior to use.

   b. The applicable ARSC Engineering Technical Services Branch will review all requests for prototyping of chemicals and approve each specific chemical application on the aircraft.

   c. Prototyping of chemicals may be accomplished by ARSC, the applicable Prime Unit, or an Air Station designated by the ISM.

   d. Engineering Officers shall not independently authorize the purchase of chemicals for the purpose of testing or prototyping of new chemical application procedures.

CHAPTER 8. AIRCRAFT INSPECTIONS

A. GENERAL. The Aviation Computerized Maintenance System (ACMS) for Coast Guard aircraft, ground support equipment (GSE), and special equipment includes all applicable inspection requirements. Instead of accomplishing a large number of maintenance tasks during an extended periodic down time, tasks are completed and accounted for on an individual basis. This allows operational and maintenance exibility and increased man-hour savings. The savings and exibility are made possible by utilizing a computer system to track the large volume of daily maintenance activities. ACMS utilizes a computer to maintain status records, schedule maintenance tasks, and report the results of maintenance operations. From updated computer data files, a series of reports and information covering all maintenance tasks is generated. Refer to ACMS Users Process Guide, CGTO PG-85-00-10, for a detailed description of the forms, reports, and procedures associated with ACMS.

B. DEFINITION OF INSPECTIONS. Maintenance inspections, varying in scope, purpose, and frequency, are performed on assigned aircraft to ensure that aircraft are maintained in a safe serviceable condition. USCG aircraft inspection types and applications are defined under two categories: Routine and Special.

NOTE

The specific inspection cycle prescribed for each type/model aircraft in USCG inventory is listed in Table 8-1. through

Table 8-5.

Table 8-1. Inspection Criteria for HC-130 Aircraft

1. Maintenance Planning Concept - Aviation Computerized Maintenance System (ACMS)

2. Routine Inspection Cycle

Inspection	Interval	Inspection Procedures	Remarks
Preflight	Prior to first flight of the day	ACMS	Valid for 24 hours. However, fuel sumps and filter drains shall be checked prior to the first flight each day.
Thruflight	Prior to second and subsequent flight each day	ACMS	Completion constitutes authorization for certification of pre flight on CG-4377.
Weekly/hourly	7 days or 45 flight hours	ACMS	To meet workload, scheduling, or operational requirements, non-deployed aircraft may be extended 1 day and/or 5 flight hours. Deployed aircraft may be extended 3 days and/or 5 flight hours.
As scheduled by Aircraft Maintenance Due Lists (MDL)	Various	ACMS	May be extended as listed in the MDL.
3. Special Inspections	On occurrence	ACMS	

See T.O. 1C-130A-6 or as scheduled by ACMS.

Table 8-2. Inspection Criteria for C-4A/C-20B Aircraft

1. Maintenance Planning Concept - Gulfstream Computerized Maintenance System

2. Routine Inspection Cycle

Inspection	Interval	Inspection Procedures	Remarks
Pre flight	Prior to first flight of the day	Pilot's Handbook	
Thruflight	Prior to second and subsequent flight each day	Promulgated Locally	
Postflight	After last flight of the day	Promulgated Locally	
Computerized Maintenance System	Various	Computer-ized Maint-enance Program Workloads	Computerized cycle system using 12 increments per cycle.
As scheduled by CG-5181	Various	ACMS	Hourly items may be extended by 10 percent.

3. Special Inspections - Dictated by nature of incident, inspections prescribed by Grumman inspection manuals.

Table 8-3. Inspection Criteria for HU-25 Aircraft

1. Maintenance Planning Concept - Aviation Computerized Maintenance System (ACMS)

2. Routine Inspection Cycle

Inspection	Interval	Inspection Procedures	Remarks
Preflight	Prior to first flight of the day	ACMS	Valid for 24 hours. A completed post flight eliminates the requirement for next day's pre flight unless maintenance is performed after that post flight. However, fuel sumps and filter drains shall be checked prior to the first flight each day.
Thruflight	Prior to second and subsequent flight each day		ACMS Completion constitutes authorization for certification of pre flight on the CG-4377.
Postflight	After last flight of the day	ACMS	Completion constitutes authorization for certification of pre flight on the CG-4377.

Inspection	Interval	Inspection Procedures	Remarks
Weekly	7 days	ACMS	Weekly inspection can be extended up to the 14th day for deployed aircraft, but inspection must be complied with upon return to home unit.
As scheduled by the Aircraft Maintenance Due List (MDL)	Various	ACMS	May be extended as listed in the MDL.
As scheduled by CG-5181	Various	ACMS	Hourly items may be extended by ten percent.
3. Special Inspections As scheduled by ACMS.	On occurrence	ACMS	Refer to Maintenance Procedure Cards (MPCs).

Table 8-4. Inspection Criteria for HH-65 Aircraft

1. Maintenance Planning Concept - Aviation Computerized Maintenance System (ACMS)

2. Routine Inspection Cycle

Inspection	Interval	Inspection Procedures	Remarks
Preflight	Prior to first flight of the day	ACMS	Valid for 24 hours. A completed post flight eliminates the requirement for next day's pre flight unless maintenance is performed after that post flight. However, fuel sumps and filter drains shall be checked prior to the first flight each day.
Thruflight	Prior to second and subsequent flight each day	ACMS	Completion constitutes authorization for certification of pre flight on the CG-4377.
Postflight	After last flight of the day	ACMS	Completion constitutes authorization for certification of pre flight on the CG-4377.
Weekly	7 days	ACMS	May be extended 1 day to meet work load, scheduling, or operational requirements.
As scheduled by Aircraft Maintenance Due List (MDL)	Various	ACMS	May be extended as listed in the MDL.

Inspection	Interval	Inspection Procedures	Remarks
As scheduled by CG-5181	Various	ACMS	Hourly items may be extended by ten percent.
Special Inspections	On occurrence	ACMS	

Table 8-5. Inspection Criteria for HH-60 Aircraft

1. Maintenance Planning Concept - Aviation Computerized Maintenance System (ACMS)

2. Routine Inspection Cycle

Inspection	Interval	Inspection Procedures	Remarks
Preflight	Prior to first flight of the day	ACMS	Valid for 24 hours. A completed post flight eliminates the requirement for next day's pre flight unless maintenance is performed after that post flight. However, fuel sumps and filter drains shall be checked prior to the first flight each day.
Thruflight	Prior to second and subsequent flight each day	ACMS	Completion constitutes authorization for certification of pre flight on the CG-4377.
Postflight	After last flight of the day	ACMS	Completion constitutes authorization for certification of pre flight on the CG-4377.
14 day	14 days	ACMS	May be extended 1 day to meet work load, scheduling, or operational requirements.
As scheduled by Aircraft Maintenance Due List	Various	ACMS	May be extended as listed in the MDL.
3. Special	On occurrence	ACMS	

Inspections

C. ROUTINE INSPECTIONS. The following inspections are considered routine:

1. Pre flight Inspection. The Maintenance Pre flight Inspection is accomplished prior to the first flight of the day and remains effective for 24 hours provided no subsequent maintenance has been performed. The pre flight inspection consists of checking the aircraft for flight preparedness by performing visual examinations and operational tests to discover defects and maladjustments which, if not corrected, could adversely affect safety or mission accomplishment.

2. Thru flight Inspection. The Thru flight Inspection requirements are accomplished as a turnaround inspection prior to takeoff on the second and each subsequent flight of the day on selected types of aircraft. Units will have satisfied the requirements for pre flight certification on the CG-4377 Part I upon completion of a thru flight.

3. Post flight Inspection. The Post flight Inspection will be accomplished after the last flight of the flying period. This inspection consists of checking the aircraft to determine if it is suitable for continued flight by performing a visual inspection of certain components, systems, or areas

to assure that no defects exist which would be detrimental to further flight. Additionally, checking for leaks, chafing, maladjustments, etc., should disclose defects requiring correction before deterioration into major maintenance items. The post flight inspection frequency ranges from once a day to once per week depending on the type aircraft.

4. Hourly/Weekly Inspections. These inspections are designed to provide servicing and verification of satisfactory functioning of critical systems/components at frequent intervals. The frequency of these types of inspections prohibits use of the computer for scheduling.

5. ACMS Maintenance Due List (MDL). These inspections, Operations, Calendar, Hourly, Cycles, and Landings, ensure a thorough examination of all systems and components on a scheduled basis.

D. SPECIAL INSPECTIONS. Special inspections are certain additional inspections, distinct in frequency from routine inspections, which are conditional upon operational environment, specific incidents, or other circumstances requiring inspections. The number of special inspections required for all aircraft and circumstances are too numerous to list. A few types are given in the following items to illustrate their distinction from routine:

1. Overtemperature, Overspeed, Overtorque, Metal Contamination, Hard Landing, Lightning Strike, Inspections (etc.). These types of special inspections define the specific maintenance actions taken based upon the circumstances of the event. Inspections of this nature have been documented into existing manuals and the Aviation Computerized Maintenance System as the result of actual experiences or a high probability of encountering the event.

2. Time Compliance Technical Order (TCTO)/Message Time Compliance Technical Order (Message TCTO). TCTOs may be issued to perform inspections of an aircraft component or system. Action is normally generated by a reported safety-of- flight incident or failure trend. TCTOs will appear on the MDL for action.

3. Aircraft Damage Sustained as a Result of a Mishap. Commanding Officers shall ensure that all damage sustained is properly inspected by competent maintenance personnel and that the complete extent of the damage has been reported. Inspection should not be limited solely to the damaged area. A complete evaluation by the Engineering Officer or other qualified Maintenance Officer should be done prior to release for flight.

4. Aircraft Damage Sustained as a Result of Flight Through Volcanic Ash. Inadvertent flight through volcanic ash clouds is an infrequent but very real and significant hazard. Numerous commercial and military aircraft have sustained tremendous damage at jet airway altitudes hundreds of miles from active volcanos. Volcanic ash is typically composed of extremely fine particles of glass shard and pumice. When this ash enters the intake of jet engines it rapidly erodes compressors, melts and glassifies in the combustion section, solidifies on turbine nozzles; resulting in vastly reduced efficiency while the electronic fuel control (EFC) calls for greatly increased fuel and coking all fuel nozzles. All of the above can happen in less than a minute. The very fine nature of the shards can contaminate pitot static, pneumatic, and electrical and avionics systems and equipment. Windscreens, lights, glass, and plexiglass become glazed and opaque. If flight through a volcanic ash cloud is known or suspected, contact Commandant (G-SEA) for decontamination procedures. Depot and Original Equipment Manufacturer (OEM) support will most likely be required.

E. REQUIREMENTS. Proper utilization of ACMS is critical to safe and efficient maintenance management. The importance of accurate data reporting and management review must be emphasized at all levels of the maintenance organization. Unit Engineering Officers will ensure that they and their maintenance supervisors have a thorough working knowledge of ACMS requirements, procedures, and capabilities.

1. Inspection Interval. The calendar and flight hour inspection times listed in Table 8-1. through Table 8-5. and the ACMS Maintenance Due Lists are the maximum intervals for inspections. The inspection schedules are limits based upon average operating experience and aircraft manufacturer's recommendations. Whenever an aircraft or engine inspection, that has both a calendar and an hour interval, accumulates the limiting number of hours before the calendar

interval has expired, the inspection becomes due and must be performed (i.e., HC-130 weekly). Commanding Officers are responsible for the adequate maintenance and corrosion control of aircraft in their custody and are to impose such other inspection requirements as necessary to meet differing environmental and operational conditions as may exist.

2. Extension of Interval. Maintenance items may be delayed at the discretion of the Commanding Officer, or his/her designated representative, as specified in the ACMS Maintenance Due List (MDL) and paragraph 8.B. Extensions beyond those listed in the MDL or paragraph 8.B. must be approved by ARSC Engineering Division. Failure to accomplish actions within this time frame shall require grounding of the aircraft. Mandatory Special Requirements (MSR) shall not be extended. Overdue MSR items shall be removed from service until the required inspection is completed.

NOTE

No extensions are authorized for Low Cycle Fatigue (LCF) or other fatigue life limits on aircraft components.

3. Restrictions to Performing Maintenance Actions Early. The following restrictions apply to performing maintenance actions early:

   a. Thirty days/10% maximum for scheduled component changes.

   b. Operations - Operations may be accomplished as early as stated in the "Do Not Do Before" column of the Operations MDL.

4. Scheduled Maintenance. Scheduled maintenance is planned maintenance performed according to the intervals specified on the ACMS Maintenance Due List. Unscheduled maintenance is defined as maintenance performed as a direct result of the failure of a specific component, system, or subsystem.

5. Suspension of Interval. The accumulation of calendar time on an aircraft may be halted for the period that the aircraft is in storage, extended repair, lengthy modification status, or other specified reasons. The Commanding Officer, ARSC will determine and authorize on an individual basis, those situations which constitute causes for interval suspension. The aircraft shall not be own while in suspension. A notation should be made on the CG-4377B indicating that the aircraft is grounded for suspension of ACMS tracking. ACMS must be notified by message of any change in ACMS status. An airframe Significant Component History Report (SCHR) entry should also be made indicating that the aircraft has suspended or resumed ACMS tracking. Calendar time accrual will resume when the aircraft is returned to operational status. ARSC will suspend/resume ACMS tracking as part of the normal Programmed Depot Maintenance (PDM) process.

6. Inspection Facilities. Aircraft missions should be planned so that ACMS inspections are performed at the home station where adequate personnel, parts, tools, and equipment are available. This will ensure a high level of quality control and minimum NMC (Not Mission Capable) time.

7. Aircraft Transfer. The physical transfer of an aircraft will take place upon completion of the mandatory joint inventory by the transferring and receiving units. Shortages of equipment on the OPNAV 4790 are unacceptable. If shortages exist at the time of transfer, the transferring unit has 15 days to rectify the inventory shortage by forwarding the shorted equipment to the receiving unit. If the shortages are not rectified within this time frame, the receiving unit will send a message formally identifying all shorted equipment to: Commandant (G-SEA), inform the transferring unit, and the ARSC Item Manager.

   a. Whenever an aircraft is transferred, except HC-130 aircraft to PDM, the following materiel shall accompany the aircraft:

      (1) Aircraft Maintenance Logbook. (Refer to paragraph 4.A.1. for content.)

      (2) Unincorporated TCTO change kits.

(3) Joint Oil Analysis Program (JOAP) records for engines and gearboxes.

(4) Spectrometric Oil Analysis Program (SOAP) (HU-25) records for engines and gearboxes.

(5) Aircraft status reports.

(6) Completed forms CG-4377 Part III, CG-4377A, and CG-4377B for the previous 12 months.

(7) Maintenance Due List (except for aircraft being transferred into ARSC PDM).

(8) Completed Maintenance Discrepancy Reports and Forms CG-5181 (CF/PP/ Cannibalization Actions) for the previous 12 months.

(9) The Classified Materiel System (CMS) custodian shall change the safe combination to the "traveling combination" and verify that it can be opened.

(10) The Data Encryption System (DES) keys will be placed in the safe.

(11) Cryptographic equipment shall be removed and applicable bypass cables and blank face plates installed.

(12) If no replacement aircraft is anticipated, two complete sets of unscheduled MPCs (including binders).

b. When an HC-130 is transferred to PDM, the following shall accompany the aircraft:

(1) Aircraft Maintenance Logbook. (Refer to paragraph 4.A.1. for content.)

(2) Up-to-date Avionics Tracking System Configuration Report for installed avionics.

(3) Change kits.

(4) Completed forms CG-4377 Part III, CG-4377A, and CG-4377B for the previous 12 months.

(5) Completed Maintenance Discrepancy Reports and Forms CG-5181 (Carry Forward Discrepancies) for previous 12 months.

(6) The CMS custodian shall change the safe combination to the "traveling combination" and verify that it can be opened.

(7) The DES keys will be placed in the safe.

(8) Cryptographic equipment shall be removed and applicable bypass cables and blank face plates installed.

8. Inspection/Discrepancy Records. Completed MPCs will be retained for 90 days; then may be discarded. Maintenance Discrepancy Reports and CG-5181 (Carry Forward Discrepancies) will be retained by unit for a period of 12 months; they may then be discarded.

9. Field Maintenance Adaptation and Feedback.

a. Changing missions, equipment, and operating conditions require review and adjustments of practices to support the USCG aircraft maintenance system. Units are encouraged to submit suggestions and proposed maintenance system improvements to the Commandant (G-SEA) via normal channels. Variations in maintenance scheduling techniques (i.e., night check crews, etc.) are within the purview of the Commanding Officer, provided the calendar/time limits are not exceeded. Results of these variations should be reported to the Commandant (G-SEA). Periodic Maintenance Management Reviews will be conducted by the Commandant (G-SEA) in an effort to provide an optimum aircraft system within available resources, and to assist in developing future requirements. Feedback from the field is an indispensable element to all portions of this program to ensure its success.

b. Suggestions for revisions/changes to the Maintenance Procedure Cards (MPCs) shall be submitted on a CG-22. Refer to the CG-22 Process Guide, CGTO PG-85-00-20.

CHAPTER 9. MAINTENANCE SUPPORT PROGRAMS

A. GENERAL. The following areas of maintenance management are considered of such sufficient importance that they must be addressed. This chapter will provide information and guidance to maintenance personnel regarding those areas where specific procedures have been developed and/or peculiar problems have been noted.

B. QUALITY ASSURANCE.

1. General.

   a. Maintenance quality and reliability is the responsibility of all maintenance personnel. The quality assurance staff ensures the quality of maintenance accomplished throughout the maintenance organization and performs necessary functions to manage the organization's quality assurance program. The combined efforts of quality assurance personnel, maintenance supervisors, and technicians are necessary to assure high quality maintenance and equipment reliability.

   b. The quality assurance inspection and evaluation program provides objective sampling of both the quality of equipment and the qualifications of maintenance personnel. In this role, quality assurance personnel are an extension of the work force and are normally tasked to perform inspections as a portion of the quality assurance program. Maintenance supervisors also perform inspections while technicians are performing maintenance on equipment and in the maintenance shops. Quality assurance serves as the primary technical advisory source in the maintenance activity, assisting the supervisors and the maintenance officer in the resolution of quality problems.

   c. The evaluation and analysis of deficiencies and problem areas are key functions of quality assurance. This activity must be more than inspection-oriented to identify underlying causes of poor quality in the maintenance effort. By determining probable causes of problems and recommending corrective actions to supervisors, quality assurance can significantly improve the quality of maintenance performed.

2. Quality Assurance Inspectors. Quality Assurance Inspectors shall be selected and designated in writing by the Engineering Officer. Enclosure (9) provides the standard format for a letter of designation for Quality Assurance Inspectors.

   a. Primary Quality Assurance Inspector. A Primary Quality Assurance (QA) Inspector is normally assigned to the QA section of the Engineering Department. The number of designated Primary QA inspectors should be kept to a minimum. The Primary QA shall inspect and sign off all grounding discrepancies and flight control work, except as noted below.

   b. Collateral Duty Inspector. The Collateral QA Inspector is assigned from a maintenance shop. He or she remains within the work force, supports the quality assurance program, and performs production inspections that do not require a Primary QA. A Collateral QA may sign off grounding discrepancies and flight control work in individual cases when approved by a supervisor possessing maintenance release authority.

3. Responsibilities. Quality assurance personnel shall perform the following:

   a. Determine the quality of maintenance throughout the unit's aircraft maintenance complex, and render complete, impartial reports and recommendations to aid in the elimination of errors in aircraft maintenance.

   b. Establish a relationship with the individual maintenance supervisors to ensure adequate corrective action on all discrepancy reports. Frequently check with maintenance supervisors to determine whether inspection coverage is adequate.

   c. Maintain master library of all applicable technical publications and directives. Review incoming technical publications and directives to determine their application to quality assurance. Assist in preparation of local maintenance instructions. Ensure that each

maintenance organization segment has available all publications applicable to their work area and that these publications are kept current.

d. Review aircraft maintenance records and all logs pertaining to the aircraft for proper corrective action, recurring discrepancies, and trends which require special action.

e. Ensure that procedures are established and observed for conducting ground tests and routine and special inspections. Selectively inspect work to ensure that the desired quality is attained. Ensure that current procedures are followed by maintenance personnel in repair and bench test of components.

f. Ensure all work instructions, check lists, and maintenance procedure cards used to define or control maintenance are complete and current.

g. Participate in flight verification checks and test flights. Ensure that pilots and crews are briefed prior to test flights so that the objectives of the flights are clearly understood.

h. Ensure that the configuration of aircraft and aircraft components are such that all essential modifications have been incorporated. Ensure that support equipment meets calibration and safety requirements.

i. Approve or reject work based on appropriate standards.

j. Spot-check equipment received for use or returned for repair; assure satisfactory condition, identification, packaging, preservation, configuration, and assure that shelf-life limits have not been exceeded.

k. Establish qualification requirements for primary quality assurance inspectors and collateral duty quality assurance inspectors. Review the qualifications of personnel assigned to these positions and maintain a record of all designated inspectors. Ensure that inspectors are limited to their area of expertise.

C. FOREIGN OBJECT DAMAGE (FOD) PREVENTION PROGRAM.

1. General. Damage from foreign objects is a continuing problem. This damage affects safety of flight, consumes excessive maintenance man-hours, imposes unscheduled workloads on supporting activities, and creates an unwarranted shortage of engines and other spare parts.

2. Responsibilities. Most FOD can be attributed to three general causes: poor housekeeping, poor maintenance practices, and carelessness. Damage due to FOD must be reduced to a minimum. Engineering Officers shall promulgate local instructions stressing the need to reduce FOD and detailing responsibilities and frequencies of inspections. Maintenance personnel shall comply with the following procedures:

a. Account for each nut, bolt, washer, piece of lock-wire, etc., when working on engines or aircraft.

b. Account for each tool used in repair work before starting any engine.

c. Remove loose objects from pockets before working on engines or aircraft.

d. Wear no loose clothing which can be drawn into an engine or other rotating components.

e. Remove loose objects from all rolling stock and support equipment used in the vicinity of engines or aircraft.

f. Perform thorough pre flight and post flight inspection of ducts, plenum chambers and engine cavities, rotor heads, and other dynamic components.

g. Pick up any loose objects in the hangar, on work platforms, or on the flight line and deposit them in the FOD prevention containers.

h. Use duct covers.

D. JOINT OIL ANALYSIS PROGRAM.

1. General. The Joint Oil Analysis Program (JOAP) monitors the condition of enclosed mechanical systems through determination of wear metal concentrations in the lubricating uid. This maintenance tool utilizes the laboratory as a focal point for information and, when properly applied, has proven to be an effective supplement to other maintenance procedures. As a diagnostic tool, oil analysis can tell you how much and what kind of wear is taking place. The following procedures are required:

   a. Take samples properly at the prescribed interval.

   b. Submit complete and accurate information with samples.

   c. Dispatch samples to the laboratory without delay.

   d. Laboratory recommendations are based upon total review of the unit history and reported to the activity in accordance with the required urgency.

   e. Perform maintenance review without delay in response to laboratory recommendations.

   f. Advise the laboratory promptly of all maintenance actions performed which either directly or indirectly effect the lubricated components of the equipment being monitored.

NOTE

History of the oil analysis program has clearly shown that the attitude of an operating activity toward the program is usually the decisive factor in its success.

2. Responsibilities.

   a. USCG aviation facilities must participate in the Joint Oil Analysis Program.

   b. The Commandant (G-SEA) will provide funds directly to DOD for USCG participation.

   c. Engineering Officers will ensure that maintenance personnel are thoroughly trained in JOAP sample taking and documentation procedures as outlined in NAVAIR 17-15-50.1, NAVAIR 17-15-50.2, NAVAIR 17-15-50.3, and NAVAIR 17-15-50.4.

NOTE

SCHR entries for engines/components being monitored by a JOAP lab will include the location of that lab and inclusive dates of monitoring that engine or component. Components removed as a result of oil analysis should state the reason for removal and include the contaminants in parts per million in the last oil sample.

3. Directives. Through an interservice agreement, all DOD operated JOAP laboratories (USAF, USA, and USN) process samples without regard to service source. This enables all customers to minimize response time between sampling and analysis by using the nearest lab. Except as provided herein, the primary directive for Coast Guard involvement in the JOAP will be NAVAIR 17-15-50.1. Procedural instructions, sampling methods and special sample requirements, forms usage, and supply/procurement actions shall be in accordance with this technical order.

NOTE

Questions regarding the JOAP should be directed to either Commandant (G-SEA) or the USAF JOAP Program Manager, San Antonio ALC/MMETP, Kelly AFB, Texas 78241.

4. For HU-25. Spectrometric Oil Analysis Program (SOAP) will be performed by Allied Signal Engines as a part of their continuing engine analysis program. Sampling kits and mailing

containers are provided. The specifications for SOAP are those contained in the ATF3-6 maintenance manuals.

NOTE

Questions regarding SOAP for the ATF3-6 engine should be directed to Commandant (G-SEA), Prime Unit, or AlliedSignal Inc., AlliedSignal Engines, M/S 2101-2F-46-00, 1944 E. Sky Harbor Circle, Phoenix, AZ 85034, ATTN: SOAP Lab, (602) 365-2248.

E. RELIABILITY CENTERED MAINTENANCE.

1. General. The term reliability centered maintenance (RCM) refers to a program of disciplined logic to realize the inherent reliability capabilities of equipment being maintained. Fundamental to RCM is the concept that reliability is designed into a component and cannot be improved with preventive maintenance. Scheduled maintenance can only ensure that the designed reliability is achieved. The RCM program will serve as one of the sources of corrective action for maintenance shortcomings. The program will monitor the performance of equipment and it will bring deteriorating trends to management's attention. In addition, it will establish whether corrective action is needed should the desired performance not be achieved. The following objectives comprise the basis of the RCM program: Refer to the RCM Process Guide, CGTO PG-85-00-30, for further information.

F. AIRCRAFT FUEL SURVEILLANCE.

1. General. Free water and foreign contaminants in aircraft fuel systems, singularly or in combination, constitute a hazard in any aircraft. Although every effort has been made to provide mobile and stationary fuelers with effective filtering systems, free water and contaminants can be introduced into an aircraft. In addition, free water can be introduced in aircraft fuel tanks as a result of condensation of moist air in empty or partially filled tanks and by separation of water in solution in fuels when exposed to relatively low ambient temperatures. Micro-organism contaminants which cling to fuel cell walls thrive and multiply in certain water-fuel emulsions. Free water and contaminants in aircraft fuel systems have many harmful effects including erratic or incorrect fuel quantity indications; icing of filters and other fuel system components; engine failure caused by fuel control icing or malfunction, and jet engine starting difficulties caused by clogged fuel ow dividers from corrosion of aircraft and fuel system parts. Furthermore, if contamination remains undetected, rubber fuel cells will deteriorate and be permanently damaged. The most effective and practical procedure by which operating activities can preclude the difficulties caused by free water in aircraft fuel tanks is to eliminate this water and inspect for the presence of foreign matter on each daily and pre flight inspection.

2. Responsibilities. Procedures shall be established to ensure compliance with the following sampling techniques:

   a. All fuel tank drains, including auxiliary tanks and readily accessible fuel system strainers, shall be drained prior to the first scheduled flight of the day. It is recommended that approximately one pint of fuel from each drain be inspected using a clear, clean, dry glass container.

   b. When free water or foreign matter is determined to be present in quantity sufficient to ground the aircraft, the aircraft should be defueled and an appropriate fuel cell and fuel system component inspection for corrosion and contamination should be made. In addition, the source of fuel should be immediately determined and cognizant personnel notified.

   c. Fuel samples shall be kept for a period of 24 hours or until another fuel sample is taken from that tank.

   d. Maintaining quality and limiting contamination of aircraft fuels may be accomplished by observing the following items:

(1) Modern aircraft engines require fuels of high quality. In order to maintain this high quality after it is received from the refinery, careful and continuous measures must be taken to prevent deterioration and contamination. Contamination can occur from mixing with other bulk petroleum products as well as from dirt, rust, and water. Experience has shown that serious engine and airframe problems will develop if inadequate attention and effort are given to maintaining fuel quality.

(2) To ensure that engines will not be susceptible to fuel starvation due to ice in the fuel system, the use of Fuel System Icing Inhibitor, MIL-I-27686E, is mandatory. Fuels obtained from military facilities contain this ice inhibitor; however, aviation units and flight crews must ensure its presence in any commercial fuel procured. Fuel system icing inhibitor use in turbine fuel is 0.08 percent minimum to 0.20 percent maximum by volume.

NOTE

Introduction of this additive will lower the ash point of JP-5 by four (4) degrees Fahrenheit and will inhibit the growth of bacteria.

(3) The following publications provide specific guidance relative to aircraft fuel storage and handling, and establish minimum quality and surveillance standards. Aviation units shall ensure that they are in compliance with the procedures outlined therein.

TITLE	PUBLICATION
Bulk Storage, Labeling and Piping	MIL-STD-161F
Quality Control of Fuels and Lubricants	AFTO 42B-1-1
Servicing of Acft and Static Grounding	AFTO 00-25-172
Aircraft Fueling Manual, NATOPS	NA 00-80T-109

G. CORROSION CONTROL PROGRAM.

1. General. Aircraft corrosion presents severe safety and economic concerns which are compounded by the corrosive environment USCG aircraft are subjected to. Although manufacturers and overhaul facilities use corrosion preventive procedures, the diligent corrosion maintenance performed at the unit is key to minimizing corrosion damage between overhaul or PDM. The Corrosion Control Program Process Guide, CGTO PG-85-00-60, provides the minimum mandatory requirements for the unit's Corrosion Control Plan.

H. EQUIPMENT CALIBRATION PROGRAM.

1. General. Test equipment and special tooling provided for maintenance and troubleshooting must be maintained at optimum performance levels. Periodic calibration of this equipment is necessary to ensure that accurate measurements are being obtained.

2. Responsibilities. Commanding Officers shall ensure that an effective calibration program is implemented for assigned equipment and tooling. DOD or commercial activities in the local vicinity or district calibration programs are generally capable of providing the service necessary. Units shall maintain records that account for the calibration, maintenance, and custody of each piece of test equipment and special tooling. Interval tracking shall be accomplished using ACMS special requirements or the calibration facility tracking list.

I. MAINTENANCE INSTRUCTIONS.

1. General. When the need arises at the local level to pass on information to maintenance personnel, a maintenance instruction shall be issued. A standard form, OPNAV 4790/35 (Enclosure (10)), or a locally produced form of like content will be used by maintenance

administrators for interpreting and/or amplifying technical directives and maintenance requirements received from higher authority and also to promulgate local instructions as necessary. The maintenance instruction is usually prepared by the quality assurance subsection and signed by the Engineering Officer.

2. Responsibilities.

   a. The maintenance instruction must be prepared carefully. It is the instrument upon which the maintenance supervisor directs his or her crew. The maintenance instruction will be used as a cover sheet for message TCTOs received by the unit and provides a convenient place for sign off of accomplished work. A locally promulgated numbering system such as 1-92, 2-92, etc., shall be used in order to facilitate filing and information retrieval.

3. Single Action Maintenance Instruction (SAMI).

   a. A SAMI may be prepared when a directive or situation dictates that specific work must be performed on a one-time basis. The work will be completed on one aircraft model or piece of equipment and will not require further action.

   b. When OPNAV Form 4790/35 is used as a SAMI, the section on the back of the form may be completed in order to provide a control for planning and record purposes. Aircraft numbers or serial numbers of equipment are entered in this section. Upon completion of the required action on each listed number, the date is entered.

4. Continuing Action Maintenance Instruction (CAMI).

   a. A CAMI is a local directive providing instructions for the performance of work which is or may be of a continuing nature.

   b. A CAMI may be prepared when a directive or situation dictates that specific work must be performed at recurring intervals, or upon the occurrence of a particular condition or incident. It is important that the CAMI clearly state when the prescribed action is to be taken and that positive control be exercised to ensure that the work is actually performed. Any new maintenance inspection requirements should be considered for inclusion in an MPC rather than CAMI.

5. Technical Information Maintenance Instruction (TIMI). A TIMI may be prepared when a directive or situation requires that technical information be promulgated within an activity. When it is necessary to disseminate information, such as techniques and local policy, which does not direct the accomplishment of specific work at definite intervals, but which is sustaining in nature, a TIMI may be issued.

6. Additional Information. Whenever any maintenance instruction has served its purpose, it should be canceled and filed for 6 months after completion date.

J. GROUND SUPPORT EQUIPMENT (GSE). The overall management, procurement, and Aviation Inventory Control Point (AICP) for Aviation Ground Support Equipment is the responsibility of the Commanding Officer, ARSC.

1. Responsibilities of the Commanding Officer, ARSC as GSE Manager.

   a. Monitor the condition of GSE.

   b. Maintain and amend as necessary the unit allowance list of GSE contained in Enclosure (11) through Enclosure (15).

   c. Prepare specifications and provide technical coordination for the procurement of new equipment and systems.

   d. Plan for, budget, and procure major GSE.

   e. Monitor GSA and DOD Surplus Property Bulletins as possible source of GSE to fill unit requirements.

f. Advise Aviation Units of any changes/TCTOs applicable to Coast Guard GSE and recommend action to be taken to comply with these changes.

g. Establish liaison with DOD ground support equipment item managers to ensure that Military Interdepartmental Purchase Requests (MIPRs) for required equipment are prepared and submitted in a timely manner.

2. Responsibilities of Aviation Units.

a. Commanding Officers shall establish and maintain preventative maintenance programs to ensure that GSE will meet projected service life requirements. Enclosure (16) specifies the minimum inspection requirements for all mobile GSE. Units are encouraged to track these inspections on the ACMS Special Requirements Due List.

b. Major premature failures beyond the repair capabilities of aviation units should be reported to Commanding Officer, ARSC for disposition instructions. Routine maintenance and replacement of component parts on a required basis is a unit responsibility funded by unit AFC 30 funds. Extensive overhaul, in excess of $3,000.00, shall be coordinated through ARSC. Commanding Officers should ensure that requests for replacement of this equipment are submitted to Commanding Officer, ARSC via the chain of command in a timely manner, keeping in mind the projected service life of items described in paragraph 9.J.3.a. through paragraph 9.J.3.g. is considered to be 10 years.

c. Lead time for planning, budgeting, and procurement of major items of GSE is 3 years. Requests should be submitted in writing giving specifics of equipment to be replaced and/or justification for any new/additional equipment desired. The Ground Support Equipment Survey will be used for general planning purposes but will not be considered as a formal request for equipment replacement.

d. Items of GSE which are not directly controlled and funded by Commanding Officer, ARSC, or listed in the Aircraft Material Stocking List (formerly CG-298), or included in Enclosure (11) through Enclosure (15) of this manual must be procured with unit or district AFC 30 funds.

3. Major Ground Support Equipment.

a. Aircraft Refuelers are provided to operating units based on the unit allowance contained in Enclosure (11). Commanding Officer, ARSC; Commandant (G-SEA), and Commandant (G-SEC) have instituted a continuing analysis regarding the feasibility of installing flight line fuel pits at selected aviation units to replace or augment refueling vehicles, where such installations will reduce overall operating costs.

b. Aircraft tow tractors are provided to operating units based on the unit allowance contained in Enclosure (12). There are two categories of aircraft tow tractors: (1) medium - up to 10,000 lb draw bar pull, and (2) large - 18,000 lb or greater draw bar pull. The category of tow tractor assigned to a unit is based on both the type aircraft assigned and any special environmental conditions encountered during towing operations.

c. Ground power units are provided to operating units based on the unit allowance contained in Enclosure (13). The purpose of the ground power units is to provide power during servicing and maintenance operations. The number of ground power units assigned is determined by the number of aircraft at the Air Station.

d. Hangar deck sweepers are provided to all aviation units. Scrubbing attachments are provided to assist in hangar deck maintenance. The primary purpose of hangar deck sweepers is FOD control. The number and/or size of sweepers assigned is based on the hangar(s) being maintained. Enclosure (14) contains the allowance for sweepers.

e. Jet Engine Test Cells are provided to selected aviation units to enhance their engine repair/test capabilities. Test cells are assigned to units based on their geographical locations, i.e., units which do not have ready access to DOD engine test facilities.

Units which do not have test cells are encouraged to utilize the nearest Coast Guard, DOD, or commercial test facility. Enclosure (14) contains a listing of USCG units which have test cells.

f. Low profile, large capacity forklifts are provided to HC-130 units for the purpose of loading and of oading cargo from HC-130 aircraft. Other types of forklifts are not included under the aviation ground support equipment program. Maintenance and requests for non-C130 forklifts should be handled at the unit/district level. Enclosure (14) contains the forklift allowance for HC-130 units.

g. HU-25, HH-65, and HH-60 hydraulic jennys and ground air conditioning units (GACU) are provided to aviation units according to the allowance contained in Enclosure (15).

K. TOOL CONTROL PROGRAM.

1. Purpose. The purpose of the tool control program is to ensure the safety of aviation personnel through the prevention of aircraft mishaps and foreign object damage (FOD) to aircraft systems that is caused by misplaced tools. Additional benefits of the program are a significant reduction of tool replacement costs and increased maintenance effectiveness due to proper tool availability.

2. Responsibilities. Aviation tools will be of such quality that they meet or exceed Society of Aeronautical Engineers (SAE) Aerospace Standards (AS-954, AS-4167, etc.) and shall be purchased and maintained in the tool control program. Supply Policy and Procedures Manual, COMDTINST M4400.19 (series), addresses the aviation tool control program and provides guidance for the purchase of tools from commercial sources to satisfy SAE Aerospace Standards.

3. Replacement tools shall conform to the same shape and size as original tools to ensure integrity of tool control which utilizes foam cutouts or other tool displacement methods. Local instructions and procedures shall be developed and implemented for a tool control program that ensures safety of flight operations by precluding releasing of any aircraft for flight with misplaced tools.

L. COMPOSITE REPAIR PROGRAM.

1. The purpose of the composite repair program is to properly maintain and repair aeronautical composite components.

2. Responsibilities.

a. Field Units. (See Enclosure (19) for a listing of materiels to be maintained by the unit.)

(1) Maintain aircraft composite component structure, hardware, and protective coatings in good condition.

(2) Procure and maintain the composite repair equipment detailed in the applicable maintenance instructions for assigned aircraft.

(3) Perform authorized composite repairs in accordance with applicable maintenance publications, including:

(a) Cosmetic repair to all areas of the aircraft is authorized.

CAUTION

POLYESTER RESINS ARE NOT AUTHORIZED FOR USE ON ANY COAST GUARD AIRCRAFT.

(b) Structural repairs authorized to tertiary and secondary structures as specified in applicable maintenance publications.

(c) No repairs shall be made to any primary structures without prior approval from ARSC Engineering. All repairs to primary or carbon composite

structures must be documented in the airframe or applicable component Significant Component History Report (SCHR). Entries will include the type, extent, and location of damage, and type of repair effected.

WARNING

NO REPAIRS SHALL BE MADE TO COMPOSITE STRUCTURES BY ANY UNIT UNLESS THEY MEET ALL SAFETY REQUIREMENTS LISTED IN T.O. 1-1-690. PERSONNEL WORKING WITH THESE MATERIELS ARE REQUIRED TO BE ENROLLED IN THE OCCUPATIONAL MEDICAL MONITORING PROGRAM. COMDTINST M5100.47 (SERIES) APPLIES.

(4) Field unit repair of the four HH-65A emergency otation containers requires prior approval from ARSC Engineering. A SCHR entry is not required for these repairs.

(5) Temporary repairs should be immediately applied to damaged secondary and tertiary composite structures. Temporary repairs are defined as those that do not restore the designed structural strength of a component, but protect it from additional environmental and physical damage. Permanent repairs shall be made as soon as practicable. All temporary repairs will be annotated as Carried Forward (CF) discrepancies on the CG-5181 until permanent repairs are effected.

b. ARSC.

(1) Provide technical assistance to field units.

(2) Write maintenance procedures as required for composite repairs.

(3) Provide field repair team to assist units as needed for composite repairs.

(4) Draft or approve repair schemes for field unit repairs to any primary composite structures.

(5) Maintain a list of approved materiels for use in composite repairs.

(6) Maintain a list of recommended sources for approved repair materiels.

M. AVIATION GAS-FREE ENGINEERING PROGRAM.

1. General. The Coast Guard Aviation Gas Free Engineering Program applies to the inspection, maintenance, and repair of aircraft and aircraft fuel systems. The purpose of the Aviation Gas-Free Engineering (AVGFE) Program is to supplement the requirements contained in COMDTINST M5100.48 (series), Confined Space Entry Manual. An air station is only required to maintain an AVGFE Program where it is reasonable to anticipate routine entry into aircraft fuel tanks. In the event that a unit does not have an AVGFE Program and the need to enter a fuel tank exists, the requirements of this program may be accomplished by a certified marine chemist, an industrial hygienist, or a certified gas-free engineer, as specified in COMDTINST M5100.48 (series).

2. References. The referenced documents describe requirements for trained personnel to measure and certify the conditions of potentially dangerous atmospheres likely to be encountered when working within, or in the vicinity of, aviation fuel cells. The following manuals provide fuel cell entry safety precautions and shall be followed.

a. ACMS Maintenance Procedure Cards

b. NAVAIR 01-1A-35, Maintenance Instructions, Aircraft Fuel Cells and Tanks

c. COMDTINST M5100.48 (series), Confined Space Entry Manual

d. AFTO 1-1-3, Inspection and Repair of Aircraft Integral Tanks and Fuel Cells

3. Aviation Gas Free Engineer (AVGFE). The Aviation Gas Free Engineer will normally be the Quality Assurance Officer, Assistant Engineering Officer, or Maintenance Officer. The AVGFE manages the engineering department's Gas Free Engineering Program. The AVGFE shall perform the duties of the qualified person as defined in COMDTINST M5100.48 (series) as they apply to aircraft maintenance.

   a. The AVGFE shall meet the following qualifications:

      (1) Complete Confined Space Safety (S0240), Naval Safety School NAS Norfolk, VA.

      (2) Meet the experience requirements of the Aviation Gas Free Engineering Technician (AVGFET) as specified in paragraph 9.M.4.a.

      (3) Be designated by the Commanding Officer in writing.

   b. The AVGFE shall be thoroughly familiar with the contents of COMDTINST M5100.48 (series) and NAVAIR 01-1A-35. The responsibilities of the AVGFE shall include, but are not limited to the following:

      (1) Monitor the Aviation Gas Free Engineering Program within the organization.

      (2) Ensure all safety requirements are followed.

      (3) Ensure assigned AVGFETs are trained and certified.

      (4) Ensure required AVGFE support equipment is available, maintained, and calibrated.

      (5) Provide for the venting and testing of fuel cells.

      (6) Provide for the preparation, issuance, and posting of Fuel Cell Entry Permits.

      (7) Ensure procedures are established for emergency rescue and medical treatment.

      (8) Ensure that annual training is accomplished as specified in COMDTINST M5100.48 (series) for confined spaces.

      (9) Maintain administrative requirements including reports and logbooks. All records shall be maintained for 3 years.

4. Aviation Gas Free Engineering Technician. Under the Aviation Gas Free Engineering Program an Aviation Gas Free Engineering Technician (AVGFET) is an individual assigned to the quality assurance department who has the responsibility for determining if a fuel system is safe from fire, explosion, and oxygen deficiency or enrichment.

   a. Qualifications of AVGFET. To become certified as an AVGFET, the individual shall meet the requirements of a Qualified Person as designated in COMDTINST M5100.48 (series) and complete the following requirements:

      (1) On-the-job training on each type aircraft assigned (minimum of three supervised certifications in each type aircraft is required).

      (2) The AVGFE shall recommend the AVGFET for certification by letter to the Commanding Officer.

      (3) The Commanding Officer shall sign and date the letter of certification and ensure that applicable entries are made in the individuals training and service record.

NOTE

AVGFET certification is valid for 1 year.

   b. The following requirements shall be accomplished annually by the AVGFET:

(1) Pass a written examination administered by the AVGFE.

(2) Submit their AVGFET logbook to the AVGFE for audit.

(3) Be recommended for renewal by the AVGFE.

(4) Be certified in writing by the Commanding Officer.

c. The AVGFET shall be responsible for the following:

(1) Conduct tests of fuel cells as required by COMDTINST M5100.48 (series) and ACMS MPCs prior to maintenance.

(2) Issue, post, maintain, and update Fuel Tank Entry Permits and ensure they are followed.

(3) Stop work and evacuate personnel from a fuel cell when an unsafe condition is detected or suspected and immediately notify the supervisor and the AVGFE.

(4) Use required test equipment properly, ensuring that all test equipment is calibrated as required.

(5) Ensure all emergency procedures are observed and that emergency personnel and equipment are in place. Ensure medical aid is available and that all personnel are familiar with procedures prior to authorizing entry or work.

(6) Ensure personnel have been briefed on the work to be performed, the hazards involved and all emergency procedures.

(7) Report to the maintenance officer any condition that is detrimental to the continued safe conduct of AVGFE related maintenance.

CHAPTER 10. PROGRAMMED DEPOT MAINTENANCE AND ENGINEERING SERVICES

A. AIRCRAFT PROGRAMMED DEPOT MAINTENANCE (PDM).

1. General. The Commandant provides for and schedules the PDM of aircraft according to established standards and, when required, the repair of aircraft due to crash damage, accelerated deterioration, or similar items. The periods between PDMs of aircraft may vary and may be accomplished by ARSC, DOD overhaul activities, or commercial contractors. The purpose of the aircraft PDM program is to provide periodic inspection of areas of an aircraft which are not accessible without extensive disassembly, to perform heavy maintenance which is beyond the capability of operating units, and to incorporate changes and modifications which are too extensive to perform at the operating unit level.

2. Requirements.

   a. Commandant (G-OCA) will furnish notification to aircraft custodians approximately 90 days prior to scheduled induction. This notification will provide specific information concerning PDM location, delivery date, etc. HC-130 units will prepare and route an AFTO 103, as described in Chapter 4., to arrive no later than 45 days prior to scheduled induction date.

   b. TCTO change kits, available at ARSC, will be shipped to arrive at the PDM activity concurrently with the scheduled aircraft. Kits which become available after aircraft induction will not be shipped without Commandant (G-SEA) authorization.

   c. Aircraft shall normally be delivered to the PDM facility with a complete inventory of equipment. With the exception of HC-130 aircraft, the ARSC Aviation Repair Division will coordinate the completion of a pre-induction flight with the field unit providing the aircraft for induction. For HC-130 aircraft, a standard test flight will be conducted prior to delivery or enroute to the PDM facility. The discrepancies discovered on these PDM-related flights shall be furnished to the PDM activity for correction.

   d. Upon receipt of an aircraft from PDM, the new reporting custodian will prepare a Standard Form 368 (Quality Deficiency Report) or post PDM report as stipulated in Chapter 4. The importance of these post PDM reports should not be minimized. These forms are reviewed at all levels and should provide specific information to the PDM activities and Commandant (G-SEA) on the adequacy of work accomplished. This information is utilized by the PDM activity to correct specific deficiencies in their PDM or Quality Control procedures. Information regarding warranty claims against the contract is also extracted from these reports. Remarks must be in sufficient detail to identify the problem clearly and to describe the action taken to correct the discrepancy, including the number of labor hours utilized (for HC-130 aircraft).

B. AIRCRAFT HEAVY REPAIR.

1. General. The purpose of this program is to repair aircraft requiring unscheduled work beyond the capability of unit maintenance facilities. Severe corrosion damage, structural failures, and crash damage are examples of the type of repairs placed in this category.

2. Requirements. If the condition of the aircraft requires extensive repair beyond unit capability before the next scheduled PDM induction, the unit shall contact the ARSC, Aviation Engineering Division, who will assist as necessary in determining the degree of repair required, and the ARSC, Aviation Repair Division, who will assist in scheduling the necessary transfer, maintenance, and resources required. Units shall submit a message "Request For Technical Assistance" message to ARSC (//ENG/REP//), with an information copy to Commandant (G-SEA). This message request shall provide a detailed description of the damage and amplifying information on the situation. ARSC, Aviation Repair Division, in close concert with the Aviation Engineering Division, will develop, advise, coordinate, and direct the repair plan (e.g., field team, depot fabrication of replacement parts, Drop-In Maintenance (DIM) at ARSC or other DOD/commercial depot activity, early PDM induction). If further flight to a suitable

maintenance facility is required, the unit shall ensure that the specific requirements of the Air Operations Manual (COMDTINST M3710.1 (series)) on Clearance of Damaged Aircraft are accomplished.

C. CONTRACTOR FIELD TEAM.

1. General. The Contractor Field Team (CFT) program is designed to provide a cost-effective alternative to incorporate depot-level modifications to aircraft systems and airframes in the field.

2. Requirements. All requirements for CFT use are managed by, and all such requests for CFT tasking shall be directly coordinated through the ARSC Aviation Repair Division. Units will be required to have an On-Site Project Officer and Primary Quality Assurance representative specifically designated in writing by the ARSC CFT Project Officer prior to the commencement of CFT work at their respective unit. The incorporation of eetwide modifications by CFT personnel is funded by Commandant (G-SEA).

D. TECHNICAL ASSISTANCE FIELD TEAM.

1. General. The technical assistance field team can be provided to any unit encountering unique or encumbering maintenance situations or aircraft damage deemed to be beyond the scope of the field unit's capabilities or resources.

2. Requirements. All requests by field units for ARSC technical assistance should be made through the respective aircraft Technical Services staff of the ARSC Aviation Engineering Division. Should the difficulty being encountered by the requesting field unit require on-site technical assistance, the field unit shall send a "Request for Technical Assistance" message as outlined in paragraph 10.B. The ARSC Aviation Repair Division will directly coordinate the personnel, repair plan, parts, tooling, special equipment, transportation, funding, and expertise necessary to assist the field unit in correcting the pertinent aircraft discrepancies.

E. AIRCRAFT COMPONENT REPAIR.

1. General. This program is designed to overhaul and repair certain aircraft components for a variety of reasons (e.g., high time, internal failure, etc.). ARSC is responsible for the final determination regarding overhaul or repair of components returned from field units. The UR, Unserviceable (Reparable) Tag (CG-1577-A) and SCHRs are sources of information used in making the final determination; therefore, they should be filled out as completely as possible.

2. Overhaul Tags. There have been instances where an item has been reported on an Unsatisfactory Report as having been overhauled at ARSC. However, when these components are received at ARSC, the tag indicates the item has only been tested and/or repaired and then returned as unserviceable. Improper data for the Unsatisfactory Report system can result in many unnecessary man-hours being expended in researching problem areas. In an effort to reduce part of this problem, ARSC has developed two different decals. One decal is white and indicates the component has been completely overhauled at ARSC. The other decal is yellow and indicates the item has only been inspected and/or repaired as necessary to return the item to a serviceable condition. Operating units are requested to assist in alleviating this problem by providing information in the last overhaul block of the Unsatisfactory Report (CG-4010) only when it is appropriate.

F. ENGINEERING SERVICES.

1. General. ARSC's Aviation Engineering Division provides engineering services and technical support to the aviation community; the appropriate Technical Services Branch is the contact point for field units. Personnel assigned include engineers and technical specialists, including manufacturer's technical representatives.

2. The following services are provided by the Engineering Division:

   a. Technical Assistance. Troubleshooting assistance for maintenance difficulties, which are beyond the scope of available technical orders, may be provided by Technical Services personnel.

b. Special Repairs. Upon request, provide engineering technical assistance to the ARSC Aviation Repair Division. This assistance includes, but is not limited to: generation of local specifications to cover repair or overhaul of equipment and aircraft when publications are inadequate, direct assistance concerning difficult or new maintenance practices, and approval or disapproval of requested engineering deviations.

c. UR Research and Analysis. Engineering receives, reviews, analyzes, and initiates corrective action on URs received. Under certain circumstances, a UR follow-up letter is sent to the originating unit. This letter may advise of corrective action taken, request additional information, or provide correct information if the UR indicates that the problem was caused by improper maintenance practices.

d. Materiel Deficiency Evaluations (MDE). There are three classifications of MDEs; the Engineering Investigation (EI), the Disassembly Inspection Report (DIR), and the Condition Exception Report (CER). The Engineering Investigation is a complete, in-depth study of any component performed by a team of highly qualified experts. The DIR is conducted by cognizant shop personnel, usually with a representative of the Quality Assurance Branch present. The CER is a basic listing of discrepancies found during disassembly by shop personnel. The costs associated with subject inspections are directly proportional to the depth and number of people involved. The order, by cost, is EI, DIR, CER. The publishing of any hard and fast rules concerning MDEs is difficult. Each case must be individually evaluated regarding the impact it would have on the overall Coast Guard aviation program. If ARSC held an EI, DIR, or CER on every component for which the submitting units requested, it would require a significant increase in dollars/personnel. Therefore, every failed/removed component must be individually screened. In cases of aircraft accidents and incidents, any reasonable suspect component should receive an appropriate, expeditious examination. The cognizant systems managers in Commandant (G-SEA) serve as the coordinating point for obtaining MDEs for such parts, providing the following functions:

(1) Determine the type of MDE necessary to provide the needed information to the mishap board.

(2) Designate the activity to perform the MDE and coordinate the induction requirements.

(3) Direct the necessary transportation of exhibits and distribution of reports of findings.

NOTE

In the case of items reported by urgent or routine URs, appropriate attention should be given in each case whether an MDE is requested or not. A suitable MDE may be accomplished at or contracted from ARSC, with ARSC fulfilling the function of (1), (2) and (3) above.

e. Message TCTOs. When requested, the division drafts Message TCTOs for correcting aircraft problems of an urgent nature.

f. Liaison with Other Agencies. Engineering communicates with other Government agencies and aircraft manufacturers concerning problems on common aircraft and equipment. Changes proposed by other agencies are reviewed for USCG application. If these proposed changes are considered necessary for safety of flight, improved mission effectiveness, or for common parts procurement, the division recommends approval to Commandant (G-SEA). ARSC Technical Publications Section is the only entity authorized to communicate with the Department of Defense, Government and Commercial Contractors concerning publication issues.

g. Publications. When requested, proposed publication changes are reviewed and corrected. The division routinely submits publication changes and corrections when

deficiencies exist. Occasionally new chapters are added to existing publications to cover new systems or maintenance procedures.

h. Manufacturer's Technical Representatives. Manufacturer's technical representatives are contracted for and assigned by the Commandant (G-SEA) to ARSC. These representatives may be utilized by operating units to help solve specific maintenance problems, as a source of information to ensure latest techniques are known, and as a source of information and instruction for the unit's training program. Direct liaison between the operating unit and the technical representatives is authorized. However, unit maintenance officers should ensure that internal procedures at that unit are established to minimize requests for information that is readily available from normal sources. Technical representatives' services requiring temporary duty assignments shall be requested by letter, message, or telephone from Commandant (G-SEA). Under special circumstances, technical representatives from manufacturers of non-contract major components are also available.

CHAPTER 11. AVIONICS

A. SCOPE. This chapter outlines general avionics systems maintenance philosophies and provides guidelines to a unit's maintenance responsibilities. Wherever this manual and the Coast Guard Electronics Manual, COMDTINST M10550.25 (series) differ, this manual shall have precedence for avionics equipment and avionics ground support equipment.

B. GENERAL AVIONICS PUBLICATIONS. Enclosure (18) contains a list of publications which should be screened by each unit and used as a basis for establishing and maintaining a general avionics technical publications library.

C. GENERAL AVIONICS MAINTENANCE. An effective avionics maintenance program is essential in keeping Coast Guard aircraft fully mission capable. The ACMS Avionics Tracking System (ATS) and other avionics maintenance programs ensure that aircraft and equipment are serviceable, safely operable, and properly configured to meet mission requirements. ATS is a centralized data base of avionics maintenance actions that enable tracking of avionics components through their entire life cycle. Specific objectives of ATS are to provide component maintainability and reliability statistics, component history, maintenance related information, and configuration control. Refer to ACMS User's Process Guide, CGTO PG-85-00-10, for a detailed description of the forms, reports, and procedures associated with ATS.

1. Corrective Maintenance.

   a. The level of corrective maintenance authorized at the unit level is defined in the applicable aircraft type avionics Integrated Logistics Support Plan (ILSP). If an aircraft type avionics ILSP has not been published, the level of repair authorized at the unit level shall be in accordance with the applicable maintenance manual series. If repair is beyond the field level capability, the equipment shall be classed as unserviceable. The Unsatisfactory Report (UR) (CG-4010) is an important record for corrective maintenance. URs shall be submitted as discussed in paragraph 4.G.

   b. Maintenance on Avionics Systems Under Warranty. No maintenance shall be performed on systems covered by warranty except as authorized by their ILSPs.

2. Preventive Maintenance.

   a. Preventive maintenance for avionics systems shall be performed in accordance with ACMS and applicable maintenance directives.

3. Minimum Performance and Fault Verification Testing.

   a. Minimum performance testing is required on all avionics equipment after corrective maintenance has been performed, when accepting serviceable materiel from a repair facility, or as required by ACMS.

   b. Fault verification testing is required on all equipment. For those Line Replaceable Units (LRUs) supported by the CTS-81, a fault print-out shall be forwarded with equipment returned for repair. If a printout cannot be included due to CTS-81 failure, a statement of that failure must be included.

NOTE

All minimum performance testing and fault verification shall be entered into the Avionics Tracking System.

4. Changes to Avionics Equipment.

   a. Policy. The general guidelines, policy, and procedures contained in paragraph 1.M. shall be applicable to changes concerning avionics equipment.

   b. Review of Technical Directives. The Commanding Officer, ARSC has the responsibility for reviewing all Technical Directives, Service Bulletins (distributed by other Government agencies and commercial firms) and materiel changes with possible application to Coast Guard avionics equipment.

c. Service Bulletins and Letters. Service bulletins and letters that provide test procedures and maintenance hints may be utilized when such procedures do not affect the form, fit, or function of the equipment (as used by the Coast Guard) and do not change the materiel configuration of the equipment. Should a service bulletin alter the configuration, Commandant (G-SEA) must approve its incorporation.

d. Depot Level Changes. Commandant (G-SEA) and Commanding Officer, Aircraft Repair and Supply Center (as authorized by the Commandant) shall be the sole authority for approving changes to avionics systems and Avionics Ground Support Equipment (AGSE) at the depot level. Depot level changes may be accomplished by:

(1) CGTO

(2) ARSC Engineering Specifications

(3) Other Government agency technical directives

(4) Overhaul directives or other directives approved by the Commandant (G-SEA)

NOTE

The Commanding Officer, ARSC may approve depot level changes that do not affect the form, fit, or function of the equipment when necessary during the depot repair cycle. The Commanding Officer, ARSC is responsible for ensuring that all changes incorporated are fully documented to the lowest allowable level of repair. This authority is limited to equipment repaired by other Government agencies and by ARSC when absolutely necessary to return equipment to a serviceable condition. Incorporation of changes that mainly affect performance characteristics or reliability shall not be accomplished by ARSC without approval of the Commandant (G-SEA). Changes to AGSE by Government calibration and repair facilities may be accomplished without prior approval if the change does not affect form, fit, or function and the change is approved by the agency operating the facility.

e. Unit Level Changes. Unit level materiel changes to avionics and AGSE must be approved by Commandant (G-SEA). Normally, this approval shall be in the form of a CGTO published by the Commandant (G-SEA). Other forms include:

(1) Message changes, double headed and distributed by the Commandant (G-SEA).

(2) Authorization by letter from the Commandant (G-SEA) under special circumstances.

NOTE

The Commanding Officer, U.S. Coast Guard Aviation Unit, Washington, D.C. may approve incorporation of commercial service changes to equipment peculiar to C-20B aircraft. The Commanding Officer, U.S. Coast Guard Air Station Miami may approve incorporation of commercial service changes to equipment peculiar to the C-4 aircraft.

5. Maintenance Beyond the Capability of the Field.

a. Printed and Integrated Circuit Boards. Printed and integrated circuit boards can easily be damaged beyond repair. Shop supervisors must ensure that the repair of integrated circuit boards is attempted only when allowed by the aircraft type avionics ILSP or maintenance manual, and only by experienced technicians qualified to effect

the repair. If qualified technicians are not available, board repair at the unit level shall not be attempted.

b. Sealed Assemblies. When they have become faulty or overage, they will be placed in the F condition (unserviceable) system unless specifically stated otherwise in the associated ILSP or technical manual.

6. Unserviceable Materiel. Once an item is declared unserviceable materiel, the practice of using it as a source of spare parts is not authorized. The F condition (unserviceable) system and policy is covered in Chapter 7. of this manual. Expeditious return of reparables (unserviceable items) is essential for effective materiel management.

7. Reusable Shipping Containers. Reusable shipping containers are available for many avionics systems. All shipments of avionics equipment must utilize these reusable containers. Additional containers needed to meet allowance may be ordered from ARSC. Containers in excess of requirements shall be returned to ARSC for future use. Commanding Officers are to ensure all avionics equipment is correctly packed for protection during shipment.

NOTE

It is imperative that avionics equipment be properly prepared and packaged before shipment to prevent damage. The use of two-chemical foam pack systems is strongly encouraged. Damage to equipment during shipment due to inadequate packing and preparation negates warranties, creates added depot maintenance expense, and decreases availability.

8. Special Handling Procedures for MOS (Metal-Oxide-Semiconductor) Devices.

a. Alert to Special Procedure. These precautions, though not all inclusive, are provided in Enclosure (20) in an effort to alert all concerned to the special procedures necessary for MOS devices.

9. Software Change Procedure.

a. Proposed changes to aircraft software shall be submitted to the appropriate Stan Unit using the Software Trouble Report (STR). The procedure for making a proposed change to aircraft software is provided in Enclosure (21).

D. FORMS AND REPORTS.

1. CG-4010 Unsatisfactory Report of Aeronautical Equipment. The CG-4010 is submitted on aeronautical equipment that operates unsatisfactorily. URs are a necessary supplement for avionics failures more extensive than random failures. The avionics UR should report unsatisfactory electronics system conditions such as: poor quality repair, inadequate equipment design, improper equipment location, human factor or display inadequacies, unsatisfactory interface to related systems, or abnormal number of failures of a given system. See paragraph 4.G. for further guidance on URs.

E. LOGISTICS.

1. Integrated Logistics Support Plan (ILSP). The ILSP contains all pertinent data relevant to the logistic support of an avionics system. Prior to acquisition of any avionics system, the Avionics System Manager, Commandant (G-SEA) of Aeronautical Engineering Division formulates a preliminary ILSP. During the system acquisition and implementation phase, the ILSP is reviewed and revised as necessary to ensure that the most effective support program is implemented. The Commanding Officer, ARSC is responsible for ensuring that data contained in the ILSP is current. CG-22s will be submitted by units when errors are discovered.

a. The purpose of an ILSP Program is to ensure:

(1) All support elements are considered prior to implementing operational use of the system.

(2) The support and maintenance policy formulated is that which provides the lowest Life Cycle Cost (LCC) while meeting the stated readiness requirements.

(3) The Aviation Inventory Control Point (AICP) and operating units are aware of and implement the policy formulated.

b. When developing the ILSP, some prime factors considered are operational effectiveness, life cycle costs, depot work-hour loading, and unit work-hour loading. It should be noted that the ILSP is not formulated with a single element as a controlling factor: i.e., 100% operational availability, zero unit maintenance required, or minimum paperwork. For example: A system such as a radar altimeter for a helicopter which is mission essential, requires that the ILSP be weighted in favor of high operational effectiveness. Conversely, the ILSP for a HC-130 PA system, would be weighted for minimum costs and would allow for a higher NMC rate than a mission essential system.

c. Individual avionics system ILSPs are being replaced with aircraft type avionics system ILSPs. The new avionics ILSP format is as follows:

(1) Section One is the introduction which includes the purpose and applicability of the ILSP along with general avionics maintenance and support concepts and ILS responsibilities.

(2) Section Two is an overview of the avionics systems in the type aircraft addressed by the ILSP.

(3) Appendices provide specific maintenance concepts and associated support resources for each avionics system/subsystem aboard the type aircraft addressed by the ILSP.

(4) Training. Indicates the formal training schools available or programmed for the system.

(5) Configuration control. Indicates what configuration control criteria has been established for the system.

(6) Allowance Spares. Normally refers the reader to the Aircraft Material Stocking List (formerly CG-298) allowance. In special cases, such as a one-of-a-kind system, the actual allowance may be established here in lieu of the Aircraft Material Stocking List. Initial outfitting of avionics spare equipment will normally be furnished to each air unit upon commissioning, when receiving new aircraft types, and when changing configurations.

(7) Avionics Ground Support Equipment (AGSE) and Special Tools. Lists the AGSE and special tools required to maintain the system. If a unit fabricated Test Bench Harness (TBH) or other unit fabricated item is required, a drawing number or other suitable reference will be provided. Common AGSE such as Digital Voltmeters (DVMs), oscilloscopes, etc., will not be listed. See paragraph 11.E.2. below for further information on AGSE.

(8) Maintenance Practices. Details the basic maintenance policy for the system. It also includes data not covered in the listed applicable manuals. Instructions in this section take precedence over any con icting instructions in the listed applicable manuals.

2. Avionics Ground Support Equipment (AGSE). Avionics Ground Support Equipment consists of general and specialized test equipment required to support avionics systems and components. Certain test bench harnesses, alignment fixtures, and special tools may also be classified as Avionics Ground Support Equipment.

a. Allowance. A listing of authorized Avionics Ground Support Equipment is contained in the Aircraft Material Stocking List.

b. Initial Outfitting. An initial outfitting of AGSE will be furnished to each aviation unit upon commissioning, when receiving new aircraft types, and when changing the system's configuration. All requests or suggestions for new or additional AGSE shall be made by official correspondence to ARSC, copy to Commandant (G-SEA), detailing the need, benefits, and other supporting data.

c. Repair and Calibration. Routine repair and calibration of AGSE shall be accomplished by using MLC, district, unit, DOD, or commercial facilities. Each district is required to develop a suitable program for the repair and calibration of electronics test equipment. AGSE shall be included in this program. In the interest of flight safety and commensurate with its use, the test equipment utilized to repair and calibrate avionics equipment shall be repaired and calibrated by one of the methods listed below. Broad guidance for electronic test equipment calibration is contained in chapter 27 of COMDTINST M10550.25 (series). The calibration intervals specified in AFTO 00-20-14, AF Metrology and Calibration Program, apply to Coast Guard avionics test equipment.

(1) Coast Guard Calibration Facilities (CALFAC). Certain major electronic shops are designated by the district commander as CALFAC. A CALFAC may be utilized for the repair and calibration of avionics test equipment when that facility is traceable to the National Standard, and when calibration and repair will not exceed 3 weeks after receipt of equipment.

(2) Other Military Facilities. The Coast Guard utilizes the repair facilities of other military services by negotiating an Interservice Support Agreement (ISSA) with the service concerned. Naval Calibration Facilities and Air Force Precision Measurement Equipment Laboratories (PMEL) are the prime sources used. These facilities are adequate for avionics test equipment repair and calibration, except when the time to repair or calibrate exceeds 3 weeks after receipt of equipment.

(3) Factory Repair and Calibration. Warranty and non-warranty repairs and calibration of commercial electronic test equipment are authorized when the lead time to repair or calibrate avionics test equipment exceeds 3 weeks, or when the customized and specialized nature of the test equipment to be calibrated/repaired dictates the use of the manufacturer or an authorized repair/calibration facility.

(4) Commercial Repair and Calibration. Avionics test equipment may be repaired and calibrated by a commercial facility when that facility is traceable to the National Standard.

d. If repair cannot be accomplished utilizing the district repair and calibration program, replacement, exchange, or repair may be requested via ARSC. Requests will be made by official correspondence and will specify the reason support is requested.

e. General Use Test Equipment and Specialized Test Equipment for Non-Avionics Use. Multi-meters and similar hand held meters will not be procured by ARSC. Procurement of General Purpose Electronics Test Equipment used primarily for station maintenance and all specialized Electronics Test Equipment for other than avionics use is a MLC or district responsibility. All units should analyze their station maintenance requirements and request MLC or district procurement for replacement Electronics Test Equipment as necessary to meet these requirements.

f. Publications. Spare publications for commercial off-the-shelf AGSE will not normally be stocked for future issue. Units requiring additional or replacement publications and unable to locate a federal supply source through appropriate publication indexes will be required to procure these publications from the equipment manufacturer.

CHAPTER 12. AVIATION MAINTENANCE SAFETY

A. SHOP SAFETY PRACTICES.

1. General. This section provides general information and establishes shop safety standards and procedures for all USCG aviation maintenance facilities. Supervisors, safety personnel, or others responsible for shop safety should familiarize themselves with these standards and assume responsibility for instructing their subordinates with the provisions of this section.

2. Shop Layout. Machines will be located to provide sufficient space for the operator to handle materiels, and perform required job operations without interference from other equipment. Lathes, milling machines, and similar types of equipment that produce cuttings or ying particles should be set at 15-degree angles to each other, and secured to oors, bases, or stands. Lighting in the immediate areas must be adequate to eliminate glare or shadows.

3. Machine Guarding.

   a. General. The most effective means of preventing unsafe operations and injuries from powered machinery is through improved machine design, or installation of protective mechanical guards which will remove much of the dependence for safety from the operator. Guards should be designed to provide maximum operator protection without interfering with equipment operations, changing of drive belts, making adjustments, or adding lubrication and should be hinged or have removable sections to provide for overall access to the machinery when required.

   b. Mechanical Guards. When machinery and powered transmission equipment are not guarded as part of their design, suitable mechanical guards, such as enclosures or barricades, shall be temporarily or permanently installed to eliminate the possibility of injury resulting from contact with moving parts or hazardous substances.

   c. Removal of Guards. Guards shall not be removed while a machine is in operation. The machine shall be completely shut down before guards are removed for maintenance or adjustment. When a machine is equipped with removable guards, it should, if practical, be equipped with an interlock control device that will stop the equipment when a guard is removed.

   d. Controls. Machine controls shall be conveniently located for the operator. Power controls will be of a type that can be locked out or in the off position. Control switches shall have all selective positions properly identified, i.e., Stop, Start, Off, Right, Left, Up, or Down.

   e. Mechanical Power Transmission Equipment. Safety guards or suitable mechanical enclosures or barriers shall be installed on power transmission equipment from the power source to the point of operation.

   f. Inspections. In addition to scheduled shop safety inspections conducted by designated safety representatives, shop supervisors shall, in the interest of operator safety, periodically inspect all shop equipment or machinery. Any equipment or machinery showing signs of misuse, mechanical deterioration, or damage that could result in failure or possible injury will be removed from service for repairs.

4. Metal Working Machines.

   a. Shop Grinders. Safety measures for grinders will be established in the following manner:

      (1) Grinders shall be equipped with shatter-proof shields.

      (2) Metal hood type guards shall enclose two-thirds of the abrasive wheel.

      (3) Tool rests shall be adjusted to provide a minimum of one eighth inch from abrasive wheel grinding surface.

(4) Care should be exercised during abrasive wheel replacement to ensure that components are assembled in proper sequence.

(5) Inspect condition of abrasive wheel prior to each use. Inspect for security, cracks, and improper metal impregnation.

(6) Protective face shield shall be worn by the operator.

b. Alligator Shears. Barrier guards shall be adjusted to prevent the operator from placing his or her hand or fingers under the shear blades.

c. Band Saws. Protective eye glasses or a face shield shall be worn by the operator. Drive wheels, spindles, and the entire area of the saw blade, except the working area of the blade between the guide rollers and the table, shall be completely enclosed.

d. Circular Saws. Protective eye glasses or a face shield shall be worn by the operator. A self-adjusting guard shall cover the area of the saw blade projecting above the cutting table surface. Over arm radial saw tables shall be of a size sufficient to prevent over-ride of the saw table.

e. Drill Presses. Protective eye glasses or a face shield shall be worn by the operator. Materiel being drilled shall be securely clamped to prevent movement or rotational action during drilling operations.

f. Lathes. Protective eye glasses or a face shield shall be worn by the operator. Chip guards and oil catches shall be provided on the lathe.

g. Power Presses. Operator protection shall be provided by enclosing all moving parts of the press. The work area guard opening shall permit insertion of stock in accordance with the rated capacity of the press.

5. Battery Shop.

a. NICAD Batteries. Nickel-Cadmium batteries shall be isolated from lead-acid batteries. Separate storage and charging rooms shall be maintained for the two types of batteries. Safety precautions will be performed as follows:

(1) The electrolyte used in nickel-cadmium batteries is a strong solution of potassium hydroxide that is alkaline and corrosive. Serious burns will result if the electrolyte comes in contact with any part of the body. Use rubber gloves, rubber apron, and face shield when handling the electrolyte.

(2) If the electrolyte gets on the skin, wash affected areas with large quantities of water or take shower with soap and water immediately. Seek medical attention in the event of skin burn or if irritation persists.

(3) If the electrolyte gets into the eyes, ush the eyes immediately with large quantities of water for at least 15 minutes. Seek immediate medical attention.

(4) If electrolyte has been taken internally, drink large quantities of water and seek immediate medical attention.

(5) Contact the Bioenvironmental Engineering Section and Ground Safety Office to determine requirements for, and locations of, eye-wash fountains and/or emergency showers.

(6) During removal or installation of cells, or removal or loosening of vent caps, a face shield will be worn to protect the eyes from electrolyte spray. This might occur when cells are removed or squeezed into place or when vent caps are removed.

(7) Exercise extreme care when working around the top of the battery. Do not drop uninsulated tools into the top of the battery assembly - severe sparking or

ashes will result, with possible harm to personnel and damage to tools, equipment, and the battery. Tools used for servicing nickel-cadmium batteries will be insulated. Rings must not be worn while working with batteries, since the loss of a finger can result if the ring fuses to the intercell connector. Tools such as sockets, ratchet handles, and other tools used in servicing NICAD batteries may be locally insulated by using heat shrink tubing. This heat shrink tubing will be inspected daily to ensure serviceability and replaced when required.

(8) Under no circumstances should a wire brush be used for cleaning. Make sure cell vents are closed before attempting to clean.

(9) Since the electrolyte used in lead-acid batteries is a strong solution of sulphuric acid and distilled water, every effort will be made to keep nickel-cadmium batteries separated from the lead-acid batteries. Do not use the same tools and materiels such as screwdrivers, wrenches, syringes, hydrometers, and gloves for both types of batteries. Do not service lead-acid and nickel-cadmium batteries in the same room.

(10) If there is a shortage of tools and it becomes necessary to use the same tools for both the nickel-cadmium and lead-acid batteries, neutralize the tools of any acid contamination prior to use on nickel-cadmium batteries.

(11) Nickel-cadmium battery shops will be mechanically ventilated to provide three to four air changes per hour in order to ensure the removal of any hydrogen gas generated as a result of charging. Smoking and other ignition sources will be prohibited in the shop. The shop location must be approved by the installation ground safety director, fire inspector chief, and medical officer.

(12) Since the hydrogen gas generated by nickel-cadmium batteries is explosive, a sufficient accumulation of the gas can be set off by ames, sparks, or bad electrical connections.

(13) The electrolyte level of the nickel-cadmium battery will not be adjusted in the aircraft. Such an adjustment would create the risk of overfilling and result in over ow and possible damage during charging.

(14) Potassium hydroxide is somewhat corrosive to glass. All glass containers, hydrometers, or other devices used that contain glass should be thoroughly washed after their contact with the electrolyte.

(15) If previous troubleshooting tests have located such problems as defective cells, electrolyte leakage, or loose connections, do not perform capacity test until the necessary repairs are made and the battery is charged.

(16) Check the battery temperature occasionally during the charge. If the battery case begins to heat excessively (reaches 115 F) it may be necessary to add water to the affected cells or discontinue charging until battery cools. Water can be added to the individual cells, using a squeeze bottle. Add water until the electrolyte is visible above the baf e plate; as the charge proceeds it may be necessary to remove any excess electrolyte as the level increases.

(17) The electrolyte level must not be adjusted until the battery has been charged and allowed to sit for 2 hours, at which time the level will be checked.

(18) When rinsing battery, do not allow water to enter the cell. Water will dilute the electrolyte, which will then require replacement; also, it will cause the cell to boil over when the battery is recharged.

(19) Do not add water to a nickel-cadmium battery that is in an unknown state of charge. If water is added to the battery when it is in an unknown state of charge, there is serious danger that the cells will be over-filled. This condition

will have such serious effects as over ow during flight charging, corrosion of battery hardware, and rupture of cell cases should vents become clogged.

(20) Gassing and the chance of electrolyte over ow increase with higher temperature for a given charging voltage. Excessive gassing and spewing of electrolyte will cause corrosion of battery hardware and loss of electrolyte. This loss will decrease battery performance and possibly cause the cell vents to become clogged, which may lead to cell rupture and other damage. Should the cells become dry from the loss of electrolyte, they will heat up and be destroyed. The inability of a nickel-cadmium battery to deliver capacity at high or low temperatures will likewise result.

(21) Undercharging will result in poor battery performance, while overcharging and high temperatures will cause excessive gassing and spewing of the electrolyte, which will also lower the performance and possibly cause damage to the battery.

(22) The vent outlet on each side of the case and the vent lines to which they are attached must be free and unobstructed at all times; otherwise, gases may build up in the battery case, resulting in an explosion. Also, the vent openings on the inside of the battery case shall be checked to assure that there are no obstructions. The rubber liners have some times closed off these openings, causing explosions or bulging of the case because of pressure build-up.

(23) For safety reasons and because replacement cells are shipped in a discharged condition, it is important that the battery be discharged before attempting to replace a defective cell.

(24) Battery terminals will be covered by a protective device, plastic covers, etc., during handling of charged battery to and from the aircraft or GSE and while being stored after charge. This will prevent accidental shorting during handling.

b. Lead Acid Batteries. Batteries of the lead-acid type shall be located in ventilated, fire-proof rooms. Safety precautions will be performed as follows:

(1) Shop personnel shall wear rubber gloves, protective eye glasses and clothing when handling electrolyte or servicing batteries.

(2) To mix electrolyte with water, always pour the electrolyte into the water slowly.

WARNING

NEVER POUR WATER INTO THE ELECTROLYTE, AS INTENSE HEAT IS GENERATED AND MAY RESULT IN BURNS.

(3) Never apply heat to a lead-acid battery which has been removed from the charging line or has been rapidly discharged under a heavy load. Under these conditions batteries are usually releasing gas and may explode.

(4) Lifting devices and rubber tired hand trucks shall be utilized when handling heavy batteries. Where manual lifting is required to remove and replace heavy batteries, request assistance.

(5) Battery shop hazards, such as chemical burns or heavy concentration of toxic gases are always potentials in battery servicing. To reduce this injury potential, all battery shop personnel shall be thoroughly trained and indoctrinated in safe operating practices.

(6) Smoking and open ames shall be forbidden in battery shops. Care shall be exercised to eliminate sources of ignition from the immediate area of battery vents during charging or discharging operations when hydrogen concentrations are maximum.

(7) Floors and battery racks shall be constructed of acid resistant materiel or painted with acid resistant paint. Eye wash fountains shall be provided or readily available for battery shop personnel.

(8) Battery shops shall include provisions for diffusion of ammable gases to prevent accumulation of explosive mixtures. If electrical exhaust fans are installed, they shall be certified explosion proof.

6. Welding. Electronic arc welding equipment shall meet the design criteria of National Electrical Manufacturer's Association "Requirements for Electric Arc-welding Apparatus," and shall be installed, maintained, and operated in accordance with the provisions of USA Standards Committee Safety in Welding and Cutting (USASZ49.1).

a. Arc Welding and Cutting Equipment. Arc welding and cutting equipment shall have disconnect switches or controllers installed on, or near, the welding machine. Terminals of the welding generator shall not be bonded to the frame of the welding machine. Cables free of splices shall be used between the electrode holder and welding machine. Fireproof screens/shields shall be used to shield other personnel from welding rays or ashes.

b. Gas Arc Welding. Inert gas tungsten arc welding shall not physically be performed on Coast Guard aircraft or in hangar spaces where aircraft are parked. Welding operations shall be performed on components which are removed from the aircraft and preferably in an approved facility or outside of hangars and away from parked aircraft.

c. Welding Inspection. Inspection of welding and cutting equipment shall be conducted at frequent intervals and records maintained at each maintenance facility. Any equipment found defective during inspections, or at any other time, shall be removed from service for repairs.

d. Compressed Chemicals. Portable cylinders of compressed fuel, gas, or oxygen shall be legibly marked, indicating either the chemical or trade name contents. All cylinders shall be stored in well ventilated areas. Oxygen cylinder storage shall be separate from fuel-gas cylinders or combustible materiels (especially oil or grease) by at least a distance of 20 feet, or have a non-combustible barrier at least 5 feet high and have a fire-resistance rating of at least 1/2 hour.

e. Flammable Gases. Oxygen or compressed ammable gases shall not be used as a substitute for compressed air.

f. Cylinders. Cylinders found to have leaking fittings or valves shall be taken into the open, away from potential sources of ignition and slowly drained of their contents.

g. Ventilation Systems. Welding shop exhaust or general ventilating systems shall be provided to minimize toxic fumes, gases, or dust which may cause respiratory afflictions or diseases.

7. Metal Shop. Metal shop safety will be performed by observing the following items:

a. Maintenance. Maintenance of powered equipment shall not be attempted until the equipment is shut down and control switch locked out or tagged.

b. Security of Materiels. All materiels undergoing work operations shall be secured in vises, clamps, or jigs.

c. Unattended Machinery. Shop machinery shall not be left unattended while operating.

d. Lifting Aids. Suitable mechanical lifting aids shall be used to position heavy stock in the machine.

e. Machine Guards. Machine guards shall not be removed while the equipment is in operation.

f. Burrs, Chips, and Metal Cuttings. Brushes shall be used to remove burrs, chips, and metal cuttings from machines, work tables, stands, and oors.

WARNING

DO NOT USE COMPRESSED AIR FOR THIS PURPOSE.

g. Cutting Procedures. Materiels undergoing cutting procedures shall not be measured while lathe is operating. Do not use hand pressure to stop spinning chucks.

h. Clothing and Protective Equipment. Loose clothing or neckties shall not be worn dur-ing lathe operations. Goggles or face shields SHALL be worn by personnel during any lathe operation.

8. Survival Shops. Survival shop safety will be performed by observing the following items:

a. Sewing Machines. Sewing machines shall have effective guards to prevent operators' fingers from being drawn under the needle. Electric machines shall be properly grounded.

b. Cleaning Fluids. The use of cleaning uids shall be done in well-ventilated rooms equipped with explosion proof exhaust fans.

c. Metal Safety Containers. Covered metal safety containers shall be provided for disposal of waste or rags saturated with ammable substances.

9. Paint Shop. Paint shop safety will be performed by observing the following items:

a. Housekeeping. Paint rooms will be kept clean and equipment stored in an orderly manner.

b. Fire Resistant Walls. Paint rooms shall be separated from other operations by fire resistant walls.

c. Spray Booths. Spray booths will be used in paint shops to minimize fire and explosion hazards. When paper is used to cover the spray booth walls, this paper will be removed and destroyed when contaminated.

d. Forced Air Ventilation. All paint spray booths shall be equipped with forced air ventilation to prevent accumulation of ammable and injurious vapors. Where water wash facilities are provided for small booths, they will have a minimum of 200 feet per minute linear air velocity across the face of the booth.

e. Aircraft Grounding. Aircraft shall be properly grounded before painting or using paint removers.

f. Fire Extinguishers. Suitable fire extinguishers shall be provided at all paint locations.

g. Disposal of Materiels. Covered metal cans shall be provided for disposal of rags, waste, and other materiels saturated with paint or ammable chemicals. These cans will be emptied daily.

h. Protective Clothing. Protective clothing shall be worn by paint shop personnel to prevent their ordinary clothing from being saturated with paint. This protective clothing will be stored in ventilated metal cabinets when not in use.

i. Paint Storage. Paint storage shall be isolated from the spray booths. Containers of not more than five gallon capacity will be used for storing paints and dopes. Large volume containers will be stored outside in a weather-sheltered area where possible.

j. Pressure Spray Equipment. All pressure spray equipment shall be inspected before use. Particular attention shall be given to pressure-reducing valves to make certain they function properly.

k. Cleaning of Equipment. Spray equipment shall be thoroughly cleaned with the proper solvent at the end of each working day to prevent paint from drying on the pressure and safety valves.

l. Minimum Spray Pressures. Minimum spray pressures will be used to avoid excessive accumulation of vapor in the air.

10. Hand Tool Safety. The following items apply to hand tool safety performance:

a. Use of Tools. All hand tools shall be kept in good repair and used only for the purpose for which they are designed.

b. Defective Tools. Tools having mushroomed heads, defective handles, worn parts, or other defects that will impair their strength or render them unsafe, shall be removed from service.

c. Storage Space. Suitable storage space such as bins, drawers, racks, or cabinets shall be provided for special hand tools when not in use.

d. Use of Tools on Ladders and Scaffolds. Tools shall not be left on ladders, scaffolds, tail stands, or overhead working spaces when not in use. When work is being performed overhead on ladders, scaffolds, or tail stands, containers shall be used to hold tools and prevent them from falling.

e. Throwing or Dropping of Tools. The practice of throwing tools from one location to another, from one mechanic to another, or dropping them to lower levels, shall not be permitted.

f. Carrying of Tools. Sharp-edged or pointed tools shall not be carried in pockets. All other tools which may project out of pockets shall be carried in safe containers.

g. FOD Prevention. Hand tools and wiping cloths will be immediately removed from enclosed or nearly inaccessible work areas of an aircraft being repaired, inspected, or modified. Tool control program shall be enforced; see paragraph 9.K.

11. Portable Power Tools (General). Portable power tools are types which receive power from electricity, air pressure, explosive charges, or rotating exible cables. Personnel who are required to use portable power tools shall be thoroughly trained in safe operating practices.

12. Electric Power Tools. The following items apply to electric power tool safety performance:

a. Operating Standards. Personnel who use electric power tools will be responsible for being familiar with accepted safe operating standards and also with the general hazards of electricity.

b. Use Near Hazardous Materiels. Electric powered hand tools shall not be used near ammable or explosive type materiels unless they are approved as being explosion proof. Portable electric hand tools shall meet grounding requirements of the National Electrical Safety Code.

c. Use in Hangars with Fueled Aircraft. All electric power tools, switches, junction boxes, and regulators will be positioned at least 18 inches above the oor level in hangars which house fueled aircraft.

d. Abuse of Power Tools. Shop personnel will avoid abusing power cords or portable electric tools. Excessive stretching, scraping, kinking, driving mechanized or portable equipment over power cords, as well as exposure to grease and oil, will cause premature failures.

e. Cutting Edge Guards. Portable electric power saws will be equipped with guards that automatically completely enclose the cutting edge when not actually sawing.

f. Damaged Blades. Cracked, bent, or damaged blades will not be used.

g. Unattended Use. Power tools will not be left running unattended.

13. Pneumatic Tools. The following items apply to pneumatic tool safety performance:

a. Protection of Air Hoses. Air hoses on the oor shall be protected against damage by motorized equipment by building a runway over the hose.

b. Inspection of Tools. Pneumatic tools shall be kept in good operating condition and thoroughly inspected at regular intervals. Particular attention shall be given to control and exhaust valves, hose connections, die clips on hammers, and chucks.

c. Safety Retainers. Safety clips or retainers will be installed on pneumatic impact tools to prevent dies and tools from being accidentally expelled from the barrel.

d. Operating Valves. Before connecting compressed air supply lines to pneumatic tools, operators will make certain the main operating valves are turned off. Not required on pneumatic quick-disconnect couplings with automatic shutoff feature (poppet valve).

e. Safety Lashing. Safety lashing shall be provided at connections between tool and hose, and at quick made-up type connections. Not required on pneumatic quick-disconnect couplings with automatic shutoff feature (poppet valve).

f. Tripping Hazards. Hoses shall not be laid over ladders, steps, scaffold, or walkways in such a manner as to create a tripping hazard.

g. Prohibited Uses of Compressed Air. The use of compressed air for blowing dirt from hands, face, or clothing is prohibited.

14. Portable Electronic Test Equipment. All portable electronic test equipment shall meet grounding requirements of the National Electrical Safety Code. This provides for the units being equipped with 3-wire AC cords and plugs.

B. HEALTH HAZARDS AND PROTECTIVE EQUIPMENT.

1. General. This section identifies health hazards and related safety practices associated with chemicals, noise, and radiation.

2. Chemical Hazards.

a. Potential Health Hazards. Potential health hazards from the use of solvents depend on several of the following factors:

(1) How the solvent is used.

(2) How operators are exposed.

(3) The duration of exposure.

(4) The concentration of vapors in the workroom.

(5) The relative toxicity hazard suggested by the threshold limit.

b. Harmful Effects. Harmful effects from industrial solvent exposure come principally from skin contact and inhalation of vapors. From the industrial standpoint, harmful effects to the mouth and digestive tract are regarded as an accident rather than a regular exposure hazard. The most common result of skin contact is dermatitis, although such an exposure can also be a source of body intake through skin absorption.

c. Inhalation. The inhalation of excess solvent vapors may produce toxic effects. In some instances, it may result only in impairments which have no discernible effects on health, but which can result in lack of coordination, drowsiness, and similar symptoms leading to increased accident proneness. In others the blood, lungs, kidneys, liver, and gastro-intestinal system, and other organs and tissues of the body may be affected or seriously damaged.

d. Poisoning. There are two kinds of solvent poisoning: acute and chronic. Acute poisoning results from inhalation of an excessive concentration within a short time. Chronic poisoning results from repeated daily exposures for extended or prolonged periods of time.

e. Disposal. Hazardous waste (fuel, oil, solvents, etc.) requiring special handling is generated by the day to day aircraft maintenance operation. All personnel must be aware of the dangers and damage that can result from improper disposal of hazardous waste. Specific guidance is contained in Hazardous Waste Management Manual, COMDTINST M16478.1 (series) and Aircraft Maintenance Potential Hazardous Waste Items, COMDTINST M16478.4 (series).

3. Dermatitis. The following items describe dermatitis-causing chemicals:

a. Specific Skin Irritants. Most industrial solvents encountered in aircraft maintenance will dissolve the natural protecting fats and oils from the skin. Some solvents are primary irritants and may cause tissue destruction upon continuous or repeated contact; a few may be skin sensitizers. All petroleum based solvents, such as paints, varnishes, cutting oils, and strong soap, are just a few of hundreds of materiels which can be classified as specific skin irritants.

b. General Irritants. General irritants are dermatitis-causing agents which produce similar effects on all persons under like conditions and include such substances and compounds as hydrochloric acid, hydro uoric acid, sulfuric acid, sodium hydroxide, potassium hydroxide, alkalies; salts of metals, such as silver, chromium, mercury, zinc; and nonmetallic materiels such as chloral, phosphorus, and bromine.

c. Procedures and Protective Measures. Continued or repeated contact with most solvents may cause dermatitis. Consequently, operational procedures and protective measures should be followed to minimize skin contact.

4. Fire and Explosion. Most industrial solvents are ammable liquids and should be carefully handled in accordance with accepted standards. Refer to National Fire Code, Vol. 1, page 325-12, for specific ammable liquids and gases. Elimination of sources of ignition is essential in the prevention of fires and explosions. The following protective safety measures shall be observed:

a. Open Flames. Open ames, such as open burners, gas pilot lights, welding, lighted cigarettes, matches, exhaust sparks from internal combustion engines, and sparks from metal tools, shall be prohibited in work areas where ammable solvents are used.

b. Preventing Accumulation of Static Charges. Prevent the accumulation of static charges and resulting sparks by electrical grounding and bonding of ammable solvent containers and storage cabinets.

c. Inspection of Hazardous Areas. Flammable solvent hazardous areas shall be inspected periodically for spontaneous combustion, overheated bearings, exposed electrical heating elements, electric light bulbs, and filaments.

d. Electric Spark Ignition. Electric spark ignition shall be prevented by the use of explosive proof electrical switches, motors, and controls in the work area where ammable solvents are used.

e. Solvent Fires. Inert gases shall be used for protection against solvent fires. Carbon dioxide (CO_2) fire extinguishers are most effective in putting out solvent fires. Nitrogen gas should be used for purging solvent gases from equipment or piping systems and in welding of solvent containers (hot work).

f. Good Housekeeping. Good housekeeping is an essential requirement where solvents are used, stored, and housed. Leaky spigots shall be repaired immediately. Spills shall be cleaned up promptly by workers, using protective equipment. All solvent

soaked cloths or waste shall be disposed of in air-tight metal containers and removed from the work area.

5. Protective Clothing. Proper protective clothing safety measures are described in the following items:

   a. Exposure to Severe Heat and Humidity. Operations involving exposures of personnel to heat or humidity in combinations in excess of the normal range of temperatures for the comfort zone shall be considered for using one of the following types of protection: protective clothing, reflective shielding, and improved ventilation.

   b. Exposure to Temperatures Below the Comfort Zone. Protective clothing shall be used where operations involving personnel exposed to temperatures below the comfort zone exist (flight-line personnel, etc.).

6. Ventilation. An adequate system of ventilation shall be provided in all areas where finishing materiels are stored, mixed, or sprayed because of the fire, explosion, and health hazards involved. Particular attention should be directed to painting operations in enclosed rooms. Adequacy of ventilation in such areas shall be determined and approved by the safety officer or committee. Proper ventilation safety measures will be achieved by observing the following items:

   a. Concentration of Toxic Materiels. The concentration of solvents or toxic constituents shall not be allowed to exceed the maximum allowable concentration in the breathing zone. The table of chemical hazards listed in the National Safety Council's Accident Prevention Manual for Industrial Operations, chapter 42, shall be referred to for the specific toxic materiels.

   b. Drying Areas. Drying areas also contribute to potential fume exposures, and ventilation shall be provided in those areas where an excessive concentration may develop.

   c. Air Supply. Air supply or make-up air provisions shall be made where appreciable air is being exhausted by spray booths or other exhaust provisions.

   d. Improper Use of Solvents. Solvents shall not be used for removing paint or grease coatings from the skin. Suitable creams and cleansers not injurious to the skin shall be provided and used by personnel for cleaning the skin.

   e. Toxic Fumes. Toxic fumes shall not be created where they are ingested into heating and ventilation systems, thereby exposing other personnel to possible acute poisoning.

7. Illumination. Offices, workrooms, stairways, corridors, passageways, and hangars shall be adequately lighted while work is in progress by observing the following items:

   a. Measurement for Lighting Minimums. Measurements by the use of a light meter calibrated in foot-candles shall be taken to evaluate the amount of lighting provided in working areas and at the work level in line with the task being performed. The criteria for lighting minimums are found in the Civil Engineering Manual, COMDTINST M11000 (series).

   b. Improvement of Light Levels. Where the light level falls appreciably below the recommended level, steps shall be taken to improve the light level as funds and work can be accomplished.

   c. Maintenance and Cleanliness of Lights. Maximum use should be made of proper maintenance and cleanliness of lights.

   d. Proper Painting. Proper painting of ceilings and walls for proper light reflection should also be used to give maximum light without glare.

   e. Supplementing General Lighting. Individual task lights may be used to supplement general lighting where the level needed is considerably above the general area lighting required.

8. Noise Hazards. Coast Guard policy regarding noise hazards and hearing conservation is contained in the USCG Safety and Environmental Health Manual, COMDTINST M5100.47 (series).

9. Personal Protective Equipment. The following items describe safety guidelines to follow when using personal protective equipment:

   a. Elimination of Unsafe Acts and Conditions. Personal protective equipment will not be used as a substitute for the elimination of unsafe acts and conditions.

   b. Respirator Equipment. Air line respirator equipment will be used in extremely high concentrations of toxic gases and vapors; i.e., for personnel entering into aircraft fuel tanks. Personnel will wear white duck or cotton overalls which have no metal accessories or buttons. Non-sparking tools shall be used near open fuel cells or taken into the fuel cell.

   c. Chemical Cartridge Respirators. Chemical cartridge respirators shall be used in spray painting operations in hangars and paint shops.

   d. Goggles and Face Shields. Goggles and face shields will be used on all metal grinding, drilling, reaming, and cutting operations.

   e. Head Protection. Head protection shall be provided for personnel working in, under, and engaged in taxiing aircraft or in any area where head strikes are a potential hazard.

   f. Welding Operations. Welding operations require the use of helmets, goggles, or eye shields with the proper lenses for the operation being performed. Protective aprons, sleeves, and gloves will be used in the welding operation.

   g. Protective Hoods and Suits. Protective acid hoods and suits will be used in the aircraft paint stripping and cleaning operation.

   h. Bench Cans. Bench cans will be used where small parts are customarily cleaned with ammable liquids.

   i. Disposal of Oily Waste. Self-closing air tight metal cans will be used for disposal of oily waste.

   j. Safety Cans. Safety cans will be used for carrying and handling small quantities of ammable liquid.

   k. Explosion-Proof Flash Lights. Explosion-proof ash lights will be used by personnel working in or inspecting an opening in an aircraft fuel tank.

10. Eye Protection. Eye-hazardous areas, occupations or trades, equipment or work, shall be determined in accordance with the following criteria:

   a. Eye-Hazardous Work. Eye-hazardous equipment or work is understood to include all machines, work outfits, processes, or procedures which produce high impact particles, burns, acid or caustic splashes, or other effects which may produce eye injury.

   b. Eye-Hazardous Areas. Eye-hazardous areas are determined by the existence of eye-hazardous equipment. Each piece of eye-hazardous equipment creates a danger zone in its vicinity. The overlapping of such zones creates an eye-hazardous area.

   c. Exposure to Fine Materiel or Particles. Exposure to dust or other fine materiel or particles blown by the wind should not ordinarily be considered as determining which piece of equipment, type of work, or work area is eye-hazardous.

   d. Identification of Isolated Eye-Hazardous Zones. If eye-hazardous zones are isolated within an area, then they should be identified separately. All personnel entering such areas or zones shall be provided with and shall wear eye protection.

11. Composite Materiels Precautions. The following safety precautions must be strictly observed while repairing or removing moisture from advanced composite structures. Air Force T.O. 1-1-690, General Advanced Composite Repair Manual, applies.

    a. Damaged composite components may be hazardous to your health. Single fibers can easily penetrate the skin, break off, and become lodged beneath the skin. Sharp tweezers and a magnification lens are generally required to remove the fiber. Graphite composite components damaged by fire may be covered with dust. Single-fiber particles with a diameter of three to four microns and length less than 0.1mm pose the greatest threat to the respiratory system. Respiratory protection is necessary in operations where dust exists or is generated. The dust should be removed through a vacuum system and disposed of properly as hazardous materiel. Eye protection, consisting of safety goggles or a face shield, is also recommended for use in work involving tear down or in any operation where the likelihood of airborne fibers exists. Blowing is not recommended as a means of cleaning.

    b. If the repair is made while the component is on the aircraft, the aircraft and a repair cart, if used, should be statically grounded. Only approved, explosion-proof electrical equipment and pneumatic equipment should be used. Electrical equipment should be grounded while in operation.

    c. For repairs that are being made over a fuel tank area, the fuel tank should be purged and checked continuously for explosive mixtures and the repair area kept well ventilated. Fire fighting equipment should be available, and special precautions should be taken while working with ammable materiels.

    d. Adequate ventilation should be provided during mixing and use of adhesives, solvents, and cleaning solvents.

    e. Heat-insulating gloves should be worn when handling hot equipment and repair materiels. Respirators should be worn for operations creating excess dust, such as the sanding of composite materiels.

    f. Pregnant personnel should not work with composites.

12. Hazardous Materiel. All units will refer to COMDTINST M16478 (series), the Coast Guard Hazardous Waste Management Manual.

C. FIRE PREVENTION.

1. General. Fire and explosions are an ever present hazard in aircraft maintenance and handling operations. Extreme care is required by all personnel to avoid the dangers of fire.

2. Fire Prevention Factors. The following basic items shall be observed for the prevention of fires and explosions:

    a. A qualified fireguard, adequately equipped with CO 2 , Halon, or dry chemical fire extinguisher, shall be stationed near the aircraft during engine starting. The fireguard will be in a position visible to the pilot or copilot and have a clear view of, and quick access to, the engine being started. He or she will stand in readiness until after all engines are operating and the danger of fire is no longer present. Refer to paragraph 12.E.3. for additional duties of a fireguard.

NOTE

The purchase of Halon fire extinguishers for flight line, hangar, and shop use is prohibited. Existing Halon fire extinguishers may continue to be used and serviced as long as it is economically feasible. Should the purchase of replacement fire extinguishers be necessary, flight line fire extinguishers shall be 150 pound dry chemical type fire extinguishers. Hangar and shop fire extinguishers shall be either CO 2 or dry chemical as recommended by the local fire marshal.

b. Designated smoking areas shall be established at each maintenance facility. Smoking shall not be permitted in hangar or ramp area or in shops where any ammable petroleum or chemical products are used or stored.

3. Housekeeping. Many industrial fires are the direct result of accumulations of oil-soaked and paint-saturated clothing, rags, waste, excelsior, and combustible refuse. Such materiel shall be deposited in non-combustible receptacles with self-closing covers that are provided for this purpose, and shall be removed from the work areas daily. The safety guidelines in the following items shall be observed:

   a. Combustible materiels shall not be stored or allowed to accumulate in air or elevator shafts, stairways, in out-of-the-way corners, near electric motors or machinery, against steam pipes, or within 10 feet of any stove, furnace, or boiler.

   b. Oil soaked, paint saturated clothing, rags, waste, or newspapers shall not be stored in locker cabinets and/or in locker rooms.

   c. Drip pans shall be used beneath aircraft engines in hangars or storage.

   d. Stoves, heaters, gasoline torches, gas and electric heaters, and electric soldering irons and pots, glue pots, and other types of smaller heating units commonly used for shop and bench work shall be equipped with personnel protective devices such as shields and holders.

   e. The risk of fire shall be minimized during cutting and drilling operations in iron, nickel, aluminum, magnesium, and other metals by using cutting or lubricating oils.

   f. Oxidizing chemicals shall be protected and stored separately from combustible materiels.

   g. Gases and vapors which are ammable shall be dispersed or evacuated by exhaust or blower systems.

   h. Welding operations shall be protected with sheet metal, ameproof canvas, or asbestos curtains to prevent sparks from reaching combustible materiels nearby. Welding or cutting will not be permitted in or near rooms containing any ammable materiels.

4. First Aid Fire Appliances. Hand operated, portable fire extinguishers are first aid appliances provided for emergency use to extinguish or confine fires in their initial stages.

5. Fire Extinguishers. Fire extinguishers shall be placed only where they can be reached easily in the event of an emergency. The location of each extinguisher shall be clearly identified by signs or color markings. No extinguisher shall be blocked off by obstructions or placed in doorways or corridors where they are likely to be knocked off the wall by passing personnel or equipment. The following guidelines also apply to use of fire extinguishers:

   a. All extinguishers shall be inspected, serviced, and maintained in accordance with the manufacturer's instructions. Visual inspections shall be made monthly and recorded on a tag attached to the extinguisher.

   b. No fire protection equipment or device shall be made inoperative and used for other purposes.

   c. Flight line fire extinguisher requirements shall be IAW AFTO 00-25-172.

D. AIRCRAFT MAINTENANCE AND FLIGHT-LINE SAFETY.

WARNING

THE WEARING OF A RING(S) AND OTHER JEWELRY WHILE MAINTAINING AIRCRAFT IS PROHIBITED. FINGER DE-GLOVING, SNAG, AND ELECTROCUTION HAZARD PRESENTED BY EXPOSED JEWELRY IS A PERSONNEL SAFETY HAZARD.

1. General. Good housekeeping in hangars, shops, and on the flight line is essential to personnel safety and efficient maintenance. The highest standards of orderly work arrangements and cleanliness shall be observed during the maintenance, overhaul, and flight line readying of aircraft. Where continuous work shifts are established, the outgoing shift shall conduct an inventory and account for their tools, remove and properly store rollaway boxes, all work-stands, maintenance stands, hoses, electrical cords, hoists, crates, and boxes that are super uous to the task or mission to be accomplished.

2. Static Electrical Inspection, Testing, and Identification Procedures (Ref. AFM 85-16 and MIL-HDBK-274).

   a. Approved Static Grounds. Approved static grounds are provided for the purpose of conducting electrostatic charges and stray electrical currents to a ground potential. These electrostatic voltages may be as high as 50,000 volts with low currents and consequently, the static ground resistance may be as high as 10,000 ohms; lower resistance is preferred. The purpose of an approved static ground interconnected with aircraft and support equipment is to place all components of the system to equal electrical potential to prevent arcing (or sparking).

   b. Testing Static Grounds. All static grounds will have resistances of less than 10,000 ohms. All existing static grounds will have a one time test with resistance values permanently recorded. Any static ground with a resistance greater than 10,000 ohms will be removed or replaced. Any static ground mechanically damaged will be repaired and retested. Static grounds do not need to be tested periodically after the initial test.

3. Safety Lanes. Aisles and clear space shall be maintained to assure access to personnel exits, sprinkler control valves, stand pipe hose, fire extinguishers, and any other fire fighting or control equipment.

4. Cords and Hoses. Power cords and air hoses shall be straightened, coiled, and properly stored when not in use.

5. Spills - Oil and Grease. Drip pans shall be utilized to eliminate engine drippings on hangar oors. Oil, grease, and other slippery substances spilled on hangar or shop oors shall be immediately removed or covered with absorbent materiel.

6. Spills - Fuel. Spills of fuels are classified into one of the three following groups:

   a. Spills involving an area of 18 inches or less in any dimension (small priming spills) are normally of minor consequence. Ramp personnel shall stand by until the aircraft is dispatched.

   b. Spills not over 10 feet in any dimension or not over 50 square feet in area and not of a continuing nature shall have a fireguard posted, up wind, with a foam-type or Halon-type fire extinguisher until the area is inert and purged.

CAUTION

HALON DOES NOT HAVE FLASHBACK PREVENTION CAPABILITIES.

   c. Spills over 50 square feet in area or of a continuing nature shall be immediately reported to the supervisor in charge, who shall notify the airport or local fire department to inert the spill. Anyone in the spill area shall leave it at once.

7. Solvents. Maintenance personnel shall not clean aircraft parts, hangar oors, equipment, or clothing with ammable solvents. All cleaning shall be done with high ash point or non-ammable substances or liquids. Solvent soaked waste, rags, and wiping cloths shall be disposed of in self-closing airtight metal containers and disposed of at the end of the day. Refer to Hazardous Waste Management Manual for disposal guidance, COMDTINST M16478.1 (series).

8. Work Stands. Suitable work stands shall be provided and used during maintenance and overhaul operations when access to the aircraft is not possible from the ground level. Temporary improvised scaffolds or stands may be used if approved by the safety officer. Treads or other walking surfaces which become slippery when worn shall be repaired or made safe by the use of abrasive or nonskid surfacing materiel. Guard rails shall be used on all maintenance work stands. Wheel locks, brakes, chocks, and jacks shall be utilized to secure workstands while in use or storage.

9. Maintenance Stands. Personnel maintenance stands and other related equipment used on aircraft parking areas will be stored in hangars or secured outside in such a manner as to avoid the possibility of collision or accidental contact with aircraft, vehicles, or other equipment. Prior to use, equipment shall be inspected to ensure that brakes, jacks, wheel locks, securing cables, or anchor connections are serviceable, so that the equipment cannot be accidentally moved by wind, propeller wash, or jet blast. Particular care will be used when moving maintenance stands and platforms to avoid overturning and striking aircraft or other equipment.

10. Engine Changes: Making Electrical Disconnects Safe. During engine change, fire hazards can result from failure to deenergize electrical systems prior to disconnecting such systems which are in close proximity to ammable vapors. Prior to engine change, the aircraft shall be grounded to eliminate static charges. Ignitor circuits shall be grounded when disconnected at the fire wall. Consult the applicable Maintenance Procedure Cards (MPCs) or techical publications for detailed information and also observe the following guidelines:

    a. The electrical systems involved in an engine change or removal/installation shall be deenergized prior to the removal of the engine and remain deenergized until any hazard of ammable vapors in the area has been removed. Such ammable vapors may accumulate during the making and breaking of ammable uid line connections.

    b. Personnel performing an engine change shall be advised when the electrical systems are deenergized and re-energized. The deenergized circuits shall be tagged or locked out so that anyone attempting to energize them will be definitely aware that others may be endangered by his or her action.

    c. Electrical and uid line disconnects shall be protected against accidental contact with dirt and moisture during the disconnect period by tight-fitting blind plugs, or by tape wrapping, or both.

11. Jacking of Aircraft. Extensive damage to aircraft and serious injury to personnel have resulted from careless or improper jacking procedures. Jacking procedures outlined in the specific Aviation Computerized Maintenance System (ACMS) MPC or aircraft maintenance manual shall be strictly adhered to when jacking aircraft. As an added safety measure, jacks will be inspected before use to determine the specific lifting capacity, proper functioning of safety locks, condition of pins, and general serviceability.

WARNING

SEVERAL TYPES OF TRIPOD JACKS HAVE A SEPARATE RESERVOIR MOUNTED TO ONE LEG WITH A QUICK RELEASE HANDLE. ENSURE THAT THE RESERVOIR IS FIRMLY ATTACHED AND THE HANDLE IS SAFETIED BEFORE JACKING. ALSO, ENSURE THE HAND PUMP IS FIRMLY ATTACHED.

Before raising aircraft on jacks, all work stands and other equipment shall be removed from under and near the aircraft. Personnel shall not remain in the aircraft while it is being raised or lowered, unless ACMS MPC or maintenance manual procedures require such practice for observing leveling instruments in the aircraft. Only the prescribed jack pads and correct adapters to jack screw extensions will be installed. Install safety stands of suitable design and capacity under the wings and tail of the aircraft after it has been raised and leveled. Keep the area under the aircraft clear of all unauthorized personnel and equipment.

NOTE

On aircraft undergoing troubleshooting or maintenance on the landing gear retraction system, jacks shall be placed under the aircraft to prevent injuries to personnel or damage to aircraft in the event the gear is retracted inadvertently. The exception being where the applicable ACMS MPCs or maintenance manuals give specific procedures or methods which will positively prevent the landing gear from retracting.

12. Jack Safety Locks. Jacks equipped with locking pins or nuts shall be set after jacking has been completed. On collet-equipped jacks, the collet shall be kept within two threads of the lift tube cylinder during raising and screwed down firmly to the cylinder after jacking is completed to prevent settling.

13. Outside Jacking. Outside jacking of aircraft will be permitted where wind conditions are favorable. ACMS or maintenance manual procedures relating to wind velocity shall be observed where these procedures are available. Wind velocity not-to-exceed 15 miles per hour shall be considered the maximum. Always ensure jacks are situated on a at, level, and hard surface before jacking.

14. Releasing Jacks. Before releasing jack pressure and lowering the aircraft, personnel shall make certain that all cribbing, work stands, equipment, and personnel are clear of the aircraft before lowering. Personnel shall ascertain that the landing gear is down, locked, and all ground locking devices are properly installed.

15. Aircraft Tire Mounting. The mounting or removing of heavy aircraft tires by maintenance personnel shall be aided by the use of tire dollies and other appropriate lifting and mounting devices to prevent possible personnel injury. Uninstalled tires shall be in ated in tire cage guards. Extreme caution shall be required in the in ation of high-pressure tires to avoid over-in ation, possibly resulting in personnel injury. Pressure regulators shall be used to eliminate the possibility of over-in ation of tires.

16. Weight Testing of Lifting Devices. Weight lifting devices used at aviation units shall be tested in accordance with the Civil Engineering Manual, COMDTINST M11000 (series). ACMS special requirements should be used to record periodic inspections/testing.

17. Welding on Aircraft. Welding shall not normally be permitted on aircraft in hangars. Where welding on aircraft is required, the procedure outlined in applicable technical orders will be followed. Safety procedures must be enforced during the welding process.

18. Oxygen Hazards and Handling Precautions. It is imperative that the highest standard of cleanliness be observed in handling oxygen. Special precautions when handling oxygen are as follows:

    a. Hands and maintenance equipment should be clean and free from oil and grease before using oxygen equipment; do not wear greasy gloves or clothing.

    b. Oil or grease must never be allowed to come into contact with or be used in the presence of oxygen cylinders, valves, regulators, gages, or fittings.

    c. A spark is not necessary to explode oxygen. The chemical reaction of fuel, gases, or oil combined with oxygen is sufficient to develop spontaneous combustion, causing an explosion.

    d. Never use oxygen from a cylinder without reducing the pressure through a regulator.

    e. Never permit oxygen cylinders to come into contact with electrical welding circuits or apparatus.

    f. Do not allow sparks or ames from welding, cutting torch, or any other source to contact cylinders.

g. Never attempt to mix other gases or compressed air in an oxygen cylinder.

h. Do not confuse air with oxygen. Oxygen is one of several elements contained in air and should always be described by its proper name. Any attempt to use oxygen in place of compressed air is apt to result in an accident. NEVER use oxygen for pneumatic tools, as a pressure agent in oil reservoirs, for paint spraying, or for any use other than breathing, welding, or cutting.

i. Do not store oxygen cylinders in the same bin or cabinet with any materiels which are likely to start or accelerate fire.

j. Oxygen cylinders must not be stored with acetylene or other combustible gas cylinders in an unventilated place.

k. Do not store oxygen cylinders and apparatus under moving machinery, cranes, or belts where oil and grease may drop and cause explosion and fire.

l. Before any attempt is made to connect oxygen cylinders to oxygen systems, ensure that each cylinder is correctly identified as containing aviation breathing oxygen, by a white band around the green cylinder or the words "aviator's breathing oxygen" painted on the cylinder.

m. Do not deplete an oxygen bottle below 50 psi.

19. Safeguarding Aircraft Breathing Oxygen Systems - Test and Repair. The following safety precautions apply to test and repair of aircraft oxygen systems:

a. Never attempt to repair or alter the oxygen system or charging equipment in other than established maintenance facilities. Field operations should be limited to the minimum test needed to ensure tightness and correct operation of the aircraft system.

b. When ow testing the aircraft system, use the minimum amount of oxygen necessary to check the system.

c. Pressure shall be released before attempting to tighten or loosen any oxygen tubing or unions. This does not include connecting or disconnecting the types of containers which incorporate self-opening and self-venting valves.

d. When making tests of oxygen distribution lines, close the valves to isolate the supply container. Test the system in accordance with specific instructions outlined in the ACMS MPC or aircraft maintenance manual. Cleanliness is vital when checking for leaks. Do not permit any oil or grease to come into contact with any escaping oxygen. Deenergize electrical circuits in the vicinity of the lines under test. Use only leak testing solutions specifically recommended for the purpose; clean off all solutions following the test.

e. When oxygen regulators or other oxygen system components on the pressure side of shutoff valves are removed for repair or replacement, the oxygen in the lines must be released and all disconnected lines plugged or capped.

20. Servicing Aircraft Breathing Oxygen Systems. The following precautions concerning servicing of aircraft breathing oxygen systems will be observed:

a. Before servicing any aircraft, aviation survivalmen shall consult the specific ACMS MPC or aircraft maintenance manual to ascertain the proper type of servicing equipment to be used.

b. Two personnel shall be required to service the aircraft with gaseous oxygen. One person shall be stationed at the control valves of the servicing equipment and one person shall be stationed where he or she can observe the pressure in the aircraft system. Communication between the two personnel is required in case of an emergency.

c. Servicing control valve shall not be opened more than 3/4 turn so it can be shut off quickly in an emergency.

d. Aircraft shall not be serviced with oxygen during fueling, defueling, or other maintenance work which could provide a source of ignition. Oxygen servicing of aircraft shall be accomplished outside the hangar.

21. Dipping Fuel Tanks. Fuel measuring sticks are occasionally used to determine fuel levels in aircraft. Plastic measuring sticks are authorized, but subject to the following conditions:

a. The measuring stick shall be momentarily grounded prior to insertion in the fuel cell.

b. Dipping shall be avoided during actual refueling.

c. When pressure refueling is used, dipping shall be avoided for at least 3 minutes after completion of the refueling operation.

22. Draining of Fuel from Aircraft. The draining of fuel from aircraft is a most dangerous operation, and one from which serious damage or loss of property and life can result if all safety precautions are not strictly observed. When it becomes necessary to drain fuel from aircraft, the following safety precautions shall be observed:

a. The aircraft shall be removed from the hangar for the removal of fuel from the tanks.

b. It is the prime responsibility of the supervisor in charge to determine that all persons working on or about the aircraft are advised that fuel is to be removed and all electrical power, internal and external, except on those aircraft where electrical power is essential to conduct the fuel draining operation, shall be disconnected.

WARNING

ELECTRICAL POWER CONNECTION OR DISCONNECTION DURING FUEL DRAINING OPERATIONS IS PROHIBITED.

c. A complete ground of the aircraft and fuel truck is required. Aircraft must be connected to ground and to truck and the truck connected to ground.

d. Adequate fire equipment shall be placed near the aircraft and attended by persons qualified in the use of such equipment.

e. No open ames, smoking, etc., shall be allowed in the area during the removal of fuel from aircraft.

NOTE

These are considered to be the minimum requirements that will tend to prevent serious results from fire during the removal of fuel from aircraft. It is the required duty of all persons concerned to not only comply with the above, but to use sound judgment and extreme caution whenever fuel is being removed from aircraft or being handled in any other way. It is the responsibility of the person in charge of hangar operation to see that the above safety practices are complied with in all respects.

23. Purging Aircraft Fuel Tanks. Whenever a fuel tank is drained for the purpose of inspection, repair, removal, or storage, it shall be purged and the following general precautions are the minimum to be observed:

WARNING

BEFORE ENTERING ANY TANK FOR INSPECTION OR INITIATING

REPAIRS, THE ACMS MPC OR SPECIFIC AIRCRAFT MAINTENANCE MANUAL SHALL ALSO BE CHECKED FOR ADDITIONAL SPECIAL PRECAUTIONS THAT ARE REQUIRED.

a. The aircraft and all equipment used in performing the operation must be properly grounded. This includes defueling equipment and any powered or pneumatic devices.

Workstands shall be equipped with a personnel static discharge plate of copper or zinc which shall be affixed in a position such that personnel can contact the plate before coming in contact with the aircraft. High static electrical charges are created by the contact and separation of unlike substances, by any sort of motion of personnel or materiel, and are a constant source of danger when generated in the presence of fuels or ammable vapors.

b. The practice of using CO 2 extinguishers to inactivate fumes in tanks which contain or which have contained hydrocarbon products is prohibited. The Coast Guard Safety and Occupational Health Manual, COMDTINST M5100 (series) contains additional information regarding this subject.

c. The draining and purging of fuel tanks shall be accomplished as a continuous operation without a lengthy time lapse between the tasks. Puddles of fuel in a tank evaporate and create an extremely dangerous atmosphere.

24. HH-60 External Fuel Tank Removal and Installation. This shall be performed in accordance with ACMS procedures. Note the safety precautions contained in these procedures.

25. Fuel Tank Entry Precautions. Aircraft fuel tanks are a permitted confined space as defined in COMDTINST M5100.48 (series). Precautionary measures for fuel tank entry apply to all Coast Guard aircraft. Confined space entry and safety procedures contained in COMDTINST M5100.48 (series), Confined Space Entry Manual; AFTO 1-1-3, Inspection and Repair of Aircraft Integral Tank and Fuel Cells, and NAVAIR 01-1A-35, Aircraft Fuel Cells and Tanks Maintenance Instructions, and applicable aircraft specific ACMS MPCs shall be followed.

26. Aircraft Communications and Electronic Systems. Communications and electronic equipment used in USCG aircraft employ extremely high voltages requiring careful use and strict observance of existing safety standards. Listed are some pertinent minimum safety precautions to be observed by technicians who work on high voltage communications and electronic equipment:

a. Repairs to communications equipment shall be made at a bench or in a shop located away from the aircraft. Radar and radio transmitting equipment shall not be operated, tested, or checked on the aircraft whenever fueling, defueling, tank repair operations, or any other similar hazardous operations are in progress. The radar antenna should not be operated within 300 feet of any fueling, defueling, or similar operation unless a dummy load is installed that prevents the energizing of the antenna.

b. Electrical components shall not be exposed to electrical power of any kind during cleaning operation. Only non ammable and non-corrosive cleaning solvents shall be used on communications and electronic equipment.

c. Electrical systems shall be deenergized during maintenance work except in those cases where a live circuit is necessary in order to accomplish the required maintenance. Where more than one maintenance operation is being carried out at the same time and an electrical system is energized, steps shall be taken to inform personnel working on the aircraft that the system is energized. Whenever possible, provisions shall be made to tag or lock out deenergized circuits so that anyone attempting to energize them will be unmistakably alerted to the resulting hazard to other maintenance operations.

27. Electric Cargo Trucks.

a. The four wheel electric trucks used for moving cargo about the aircraft ramp and adjacent areas contain relays and sliding bar contactors that can cause arcing and sparking. Consequently, the vehicles are unsafe for use in areas where ammable liquids or explosive vapors exist.

b. Warning decals have been provided to each activity for use on the electric cargo trucks. The decal should be placed in a conspicuous location on the dash of the vehicle. Additional decals can be obtained from Commanding Officer, ARSC, ATTN: Customer Service Section.

WARNING

THIS VEHICLE SHALL NOT BE OPERATED INSIDE AIRCRAFT HANGARS OR OTHER BUILDINGS UNLESS THE AREA IS WELL VENTILATED AND FREE OF SPILLED FUEL OR OTHER FLAMMABLE LIQUID. THIS VEHICLE SHALL NOT BE OPERATED WITHIN 50 FEET OF AIRCRAFT DURING FUELING/ DEFUELING OPERATIONS OR IN THE EVENT OF AN AIRCRAFT FUEL SPILL.

E. AIRCRAFT GROUND HANDLING SAFETY.

1. General. This section establishes detailed procedures for towing, engine run-up, and taxiing.

2. Responsibility. Each activity operating and maintaining USCG aircraft shall adhere to the following provisions:

   a. Taxiing of aircraft should be held to a minimum by utilizing towing procedures whenever practical.

   b. Added caution shall be observed when movement of aircraft is necessary during darkness and/or inclement weather. Taxi signalmen shall use illuminated wands whenever guiding aircraft at night.

   c. Except in emergencies, aircraft will not be moved or operated unless the minimum approved crew, as specified in this section, is available and utilized.

3. Fireguard. A qualified fireguard, adequately equipped with CO_2, Halon, or dry chemical fire extinguisher shall be stationed near the aircraft during any and all engine starting. He or she will be in a position visible to the pilot or copilot and have a clear view of, and quick access to, the engine being started. When practicable, the fireguard shall have intercommunication system (ICS) communications with the person starting the engine. The fireguard shall ensure that the engine, prop, helicopter rotor area, and jet blast or prop wash path is clear of foreign objects, personnel, or property that may be affected. Fire fighting will normally be external to the engine and fire will normally be fed by dripping or running fuel, oil, or hydraulic uid. The fireguard should not introduce extinguishing agent into the engine on internal jet or turbine engine fires unless the fire cannot be controlled with the induction of air. The fireguard shall stand by until all engines are operating and danger of fire no longer exists.

4. Cockpit Checklist. The appropriate cockpit checklist shall be used for starting, operating, and testing aircraft engines. The checklist procedure shall be followed before, during, and after the operation.

5. Ground Power Units. Engine driven generators, heating and air-conditioning units shall be located as far as practical from refueling facilities, tank vents, and drains. Only qualified and authorized personnel shall start or operate ground power and auxiliary power units. Power units shall be positioned away from potential sources of aircraft fuel or fuel vapors and in a manner which clears all parts of the aircraft. Ground power units shall be equipped with a suitable capacity CO_2, Halon, or dry chemical fire extinguisher, or one shall be readily available at all times. Engine driven power units shall be shut down prior to connecting or disconnecting external power cables to the aircraft.

6. Towing Aircraft. Aircraft ground handling personnel shall be thoroughly familiar with all procedures pertaining to the types of aircraft being towed and the local operating procedures regarding the ground movement of aircraft. Newly assigned personnel will complete an adequately supervised on-the-job training program before assignment to ground handling aircraft. Only competent maintenance personnel, properly trained, will supervise the aircraft towing team.

   a. Minimum Number of People Required. The minimum number of people employed on the towing team when towing aircraft in a congested area as defined by the Commanding Officer, shall be in accordance with the following table:

NOTE

Each Aviation Unit is faced with different circumstances in regard to aircraft movement, i.e., hangar size, number and type aircraft, ramp space, proximity to other structures, etc. No one definition of congested area can be applied. Each Commanding Officer shall ensure his or her unit has a well defined towing plan. Parking and towing guidelines can be painted to aid in safe movement.

	HC-130	HU-25	HH-65	HH-60
Supervisor	X	NOTE 1	NOTE 1	NOTE 1
Vehicle Driver	X	X	X	X
Brakeman in Cockpit	X	X	X	X
Hydraulic Pressure Monitor	X			
Wing Walker (STBD)	X	X	X	X
Wing Walker (PORT)	X	X	X	X
Tail Walker	X	NOTE 2		

NOTE

1. The supervisor may double as either the vehicle driver or one of the wing walkers.

2. Because of the swept-back wing of the HU-25, the wing walkers may provide for tail clearance.

b. The supervisor shall be in complete charge of the towing team and take a position that will ensure surveillance of the towing procedures and performance of other team members, normally in front of the tow vehicle. The supervisor shall stop the operation at the direction of any member. The operation shall not resume until the supervisor has personally checked cause of stop and determined that it is safe to resume. The supervisor shall advise each tow team member of:

(1) Position and responsibility.

(2) Signals to be used.

(3) Critical phases of aircraft movement.

c. The towing vehicle driver shall be responsible for operating his or her vehicle in a safe manner and shall obey emergency stop instructions given by any team member. The operator shall be a qualified driver.

d. A qualified person shall be in the pilot's seat of the towed aircraft to observe and operate the brakes as required by towing team signals. For HC-130 towing operations, another qualified person shall be assigned to maintain auxiliary hydraulic system pressure utilizing the hand pump.

e. The supervisor of the towing operation shall verify that the locking devices are set to proper position on aircraft prior to towing. The locking device(s) shall be reset after the tow bar has been removed from the aircraft.

f. Under no circumstances shall personnel walk or ride between the nose wheel of an aircraft and the towing vehicle, nor will they ride on the outside of a moving aircraft.

In the interest of personnel safety, no person (except in an emergency situation) shall attempt to board or leave a moving aircraft or towing vehicle.

g. The towing speed of the aircraft shall not exceed that of the walking team members. The aircraft's engines shall not be operated at any time while the aircraft is being towed into position.

h. The aircraft brake system shall be charged before each towing operation. Aircraft with faulty brakes shall only be towed into position for repair of brake systems, and then only with personnel standing by ready with chocks for emergency use. Chocks shall be readily available in case of any emergency during any towing operation.

i. To avoid possible personnel injury and aircraft damage during towing operations, requirements for the position of aircraft doors (open or closed) and ladders, and the use of gear down locks and pins during towing operations shall be clearly defined and delineated and will be promulgated as part of local unit or engineering towing instructions.

j. Prior to towing any aircraft, towing team members shall check all tires and landing gear struts for proper in ation.

k. When towing aircraft, the vehicle operator shall not jerk the aircraft or start and stop suddenly. Cockpit personnel can apply aircraft brakes at their discretion during towing operations.

l. Aircraft shall be parked in specified areas only. Generally, the distance left between rows of parked aircraft shall be enough to allow immediate access of emergency vehicles in case of fire and also permit free movement of equipment and materiels.

m. Prior to any movement of aircraft across runways or taxiways, contact shall be made with the airport control tower for clearance to proceed.

7. Engine Starts and Run-up. Prior to starting engines, the wheels shall be chocked and brakes set. The following precautions shall be observed:

a. The Commanding Officer shall designate engine run-up areas in accordance with airport procedures. Areas should be policed regularly for debris and should be adequately marked to prevent persons walking into jet or propeller blast.

b. Only personnel qualified in aircraft type and designated in writing by the Commanding Officer are authorized to start and run-up aircraft engines. They shall occupy the pilot's seat unless they are directly supervising a trainee and have physical contact with the engine controls. There should be at least two people in the cockpit for all engine starts and run-ups.

c. All engine starts and run-ups shall be made in accordance with airport noise abatement procedures, appropriate checklist, aircraft flight manual, and/or operation manual.

d. Except in emergencies, all engine starts shall be made with a properly equipped fireguard standing by. This person shall ensure that all equipment in the aircraft or engine area has been removed or secured, and personnel are clear of air intake and exhaust hazard area of jet engines, prior to giving the "Clear-to-Start" signal.

e. All engine run-ups will normally be performed with cowling installed, and when possible, the nose of the aircraft pointed into the wind. Main rotor blades for the HH-60 must be spread prior to starting engines.

f. All helicopter engine starts accomplished by non-pilot maintenance personnel shall be made using only the normal speed selector. In no case will the emergency throttle/ emergency fuel control lever be used in starting helicopter engines.

g. Maintenance on helicopter systems that are in close proximity to the rotor system will not be performed with the rotor turning due to the risk of serious injury.

h. The following procedures will be observed for leak checks after maintenance. The technician doing the leak check will be in direct ICS communication with the cockpit and wear a helmet, flight suit, flight gloves, and boots.

WARNING

ENGINE COMPONENTS FROM THE COMBUSTION SECTION AFT ARE EXTREMELY HOT. DO NOT TOUCH.

WARNING

EXTREME NOISE HAZARD. FLIGHT HELMET (VISOR DOWN) AND HEARING PROTECTION ARE REQUIRED.

CAUTION

FOD HAZARD - SECURE ANY LOOSE GEAR THAT COULD BE INJESTED INTO THE INTAKE.

CAUTION

ONLY QUALIFIED PERSONNEL WILL BE ALLOWED TO PERFORM ENGINE LEAK CHECKS.

8. Aircraft Taxiing. This section describes the duties of the taxi signalman (plane director). Enclosure (17) illustrates standard taxi signals to be used for shore based operations. Ship-board operations are covered in Shipboard-Helicopter Operational Procedures, COMDTINST M3710.2 (series).

   a. Any time an aircraft is ready to taxi from the flight line or is returning to the line for spotting, it should be directed by one or more taxi signalmen, as necessary. Commanding Officers may authorize taxiing without taxi signalman providing the ramp has clearly defined taxi lines and parking spots.

   b. The taxi signalman should assume and maintain a position where he/she can see the pilot's or qualified aircrew's eyes at all times. If it is necessary for him/her to lose sight of the pilot's eyes in changing positions, or for any reason, he/she should signal the pilot/aircrew to stop until he/she has taken up his/her new position.

   c. The taxi signalman has a definite position to maintain when directing aircraft, calculated to give him/her all possible advantages. This position should be slightly ahead and in line with the wingtip on the pilot's side of the aircraft.

   d. When an aircraft is being taxied within 25 feet of obstructions, a minimum of one wingwalker for each wingtip shall be provided. The taxi signalman must always be in a position to see the wingwalkers and the pilot's eyes. Aircraft must not be taxied at anytime within 5 feet of obstructions.

   e. Directing aircraft at night requires extra precaution. The taxi strip and parking area should be inspected for workstands and any other mobile equipment which can damage an aircraft.

9. Aircraft Fueling Operations. The purpose of grounding and bonding of the aircraft with the refueler/defueler systems during refueling and defueling operations is to equalize the static electrical potential between the incoming fuel and the fuel in the aircraft. It has been determined and supported by the National Fire Protection Association that grounding of aircraft during refueling/defueling has no effect on equalizing the static electrical potential between the aircraft and the refueler. For this reason, all aircraft being serviced at Coast Guard Aviation Units are only required to be bonded to the refueler/defueler system during fueling and defueling operations. The primary directive for Coast Guard fueling operations is Air Force T.O. 00-25-172.

NOTE

The grounding and bonding criteria specified in AFTO 00-25-172 apply only to servicing of aircraft. In addition to these minimum requirements, Coast Guard aircraft are to be grounded whenever parked.

a. Splash proof goggles/face shield will be worn for all fueling operations.

b. Hot fueling operations are not allowed within 200 feet of an occupied building, unless operating under a waiver from Commandant (G-SEA).

CHAPTER 13. AIRCRAFT SALVAGE

A. GENERAL. Recovery and salvage of Coast Guard aircraft is the responsibility of the Commanding Officer of the unit to which the aircraft is permanently assigned. This responsibility includes the establishment and maintenance of a salvage plan, the assignment of a salvage officer, coordination of recovery/salvage resources, and execution of the recovery/salvage effort.

B. SALVAGE PLANS. All helicopter aviation units shall prepare and maintain a helicopter salvage plan. Provisions for fixed wing salvage, where appropriate, shall be addressed in the unit pre-mishap plan. The purpose of this plan is to assist unit personnel in initiating and coordinating recovery and salvage if an aircraft MISHAP necessitates such an effort. The helicopter salvage plan should be designed to interface with, and amplify, the unit pre-mishap plan. This plan shall include, but is not limited to, the following:

1. Checklist format of action items required for various key individuals (CO, OPS, EO, Salvage Officer, etc.).

2. A complete list showing location of all equipment stocked in the unit's salvage kit. This list shall include, but not be limited to, all equipment specifically listed in the appropriate aircraft maintenance manual for recovery/salvage of that type aircraft.

3. Specific recovery/salvage procedures - Specific procedures for recovery/salvage of each type helicopter are contained in detail in the appropriate aircraft maintenance manual. Additional procedures and techniques can be documented as desired.

4. Each salvage plan shall be updated annually. It is desirable that this be performed by a prospective salvage officer. A list of potential resources available within the unit's normal geographic area of operation shall be maintained. Specific attention should be given to assuring that the list of resources is current and that phone numbers and other contact information are correct.

5. Salvage plans shall be maintained in a current status in district operations centers. Additionally, a copy will be presented to Commandant (G-SEA) during the annual Commandant (G-SEA) visit.

C. ASSIGNMENT OF SALVAGE OFFICERS. Assignment of the Salvage Officer is the responsibility of the Commanding Officer. This individual will be the Commanding Officer's direct representative and shall be responsible for coordination and implementation of the recovery/salvage effort. It is recommended that all prospective Salvage Officers maintain a working knowledge of all references listed herein.

D. RESPONSIBILITIES FOR AIRCRAFT RECOVERY/SALVAGE.

1. Unit Commanding Officer - The Commanding Officer of the unit to which an aircraft is permanently assigned has full responsibility for the recovery/salvage of his/her aircraft. Assistance in carrying out this responsibility is available to him/her as discussed below. A written report of all salvage/recovery scenarios will be submitted to Commandant (G-SEA) via the chain of command within 30 days of occurrence.

2. District Commanders - District Commanders are responsible for coordination of district resources in support of a recovery/salvage effort. They are also responsible for coordination of commercial or other service resources from within the district.

3. Area Commanders - Area Commanders are responsible for coordination of area resources in support of a recovery/salvage effort.

4. Commandant (G-SEA) - Is responsible for providing:

   a. Approval for unusual funding requirements in connection with a recovery/salvage operation.

   b. Assistance in coordination of any extraordinary resources (i.e., commercial or other military service), which are beyond unit or district capability to coordinate.

c. Technical Assistance - Commandant (G-SEA) is generally the most current source of information relating to recovery/salvage. All members of the branch are available through Flag Plot, to advise or provide technical information to Salvage Officers. If requested so by the unit, Commandant (G-SEA) will provide an experienced advisor for any salvage operation.

E. COAST GUARD VESSEL RECOVERY CAPABILITIES. Polar class icebreakers are the only Coast Guard vessels considered adequate for recovering an HH-60 helicopter. Other Coast Guard vessels should be used for such an operation only in extreme circumstances, with the knowledge that considerable salvage related damage is probable. One hundered seventy-five foot WLM or WLB bouy tenders are marginally adequate for recovering HH-65 helicopters. These vessels should normally be utilized only under ideal (near at calm) conditions when no other resources are readily available. They may be utilized in less than ideal conditions as the situation dictates, with the realization that significant salvage related airframe damage is probable. Generally, commercial or other military service resources are desirable and should be used for water recovery of Coast Guard helicopters. The following basic minimum requirements are defined in the respective aircraft maintenance manuals.

Type ACFT to be Recovered	Main Hoisting Capability	Ability to Hoist Outboard of Gunwale
HH-65	30,000 lbs	25 ft
HH-60	50,000 lbs	50 ft

F. SALVAGE REFERENCES. The following is a list of references that pertain to aircraft recovery/salvage and a brief description of what information is in each publication.

1. Air Operations Manual, COMDTINST M3710.1 (series) - Assigns Commanding Officer's basic responsibilities with regard to assigned aircraft.

2. Appropriate Aircraft Maintenance Manual - Lists specific recovery/salvage techniques and recommended salvage equipment list. While this technical information relates strictly to an aircraft in the water, it is assumed that the basic information will be modified to apply to other recovery/salvage situations as well.

3. Aviation Unit Salvage Plans - Contains procedures and information pertinent to specific units/geographic locations.

4. Shipboard Helicopter Operational Procedures Manual, COMDTINST M3710.2 (series) - Provides flight-deck-equipped cutters with basic guidelines for their responsibilities during the initial phase of a recovery/salvage operation.

5. Aerial Recovery of Aircraft, COMDTINST M13482 (series) - Provides guidance on joint service salvage efforts.

CHAPTER 14. POLLUTION PREVENTION

A. SCOPE. The Coast Guard is committed to an aggressive environmental program which fully supports compliance with environmental laws and regulations. It is Coast Guard policy that environmental compliance receive command priority at every level. Inherent in every mission area is the underlying obligation and responsibility as stewards of the land, sea, and air to make environmentally sound operational and budgetary decisions.

B. GENERAL. This section provides general information and establishes pollution prevention standards and procedures for all USCG aviation maintenance facilities. Maintenance managers, supervisors, and technicians should familiarize themselves with these standards and assume the responsibility for the protection of the environment with the provisions of this section.

C. HAZARDOUS WASTE MANAGEMENT. Hazardous waste disposal shall be in accordance with COMDTINST M16478.1 (series), Hazardous Waste Management Manual. It is the responsibility of each aviation maintenance facility to establish guidelines that prevent the improper collection, storage, and/or disposal of regulated and non-regulated waste.

D. HAZARDOUS MATERIELS MINIMIZATION. Each aviation facility shall have in place a procedure to routinely evaluate the procurement, storage, and use of hazardous materiels. This review will include the procurement of the proper materiels (as specified on the Authorized Chemical Use List), proper storage time (30 days for the shops, 90 days for supply), and the correct application of the product.

E. MANAGEMENT OF RECOVERABLE AND WASTE LIQUID PETROLEUM PRODUCTS. AFTO 42B-1-23 shall be used to supplement the applicable environmental regulations by providing procedures and requirements for the collection, segregation, storage, and disposition of Recoverable and Waste petroleum products which are generated through normal aircraft maintenance operations. Aviation Fuel Bowsers procured or constructed after 1 January 1995 for aircraft ground support shall meet the standard specifications contained in AFTO 42B-1-23, Appendix A.

CHAPTER 15. AVIATION LIFE SUPPORT EQUIPMENT

A. SCOPE. This chapter outlines general Aviation Life Support Equipment systems management and provides guidance regarding organization and responsibilities.

B. GENERAL. Aviation Life Support Equipment (ALSE) is a key element in the Coast Guard's aviation mission support structure. ALSE is funded by both AFC-30 and AFC-41 as outlined in the Financial Resources Management Manual, COMDTINST M7100.3 (series). Therefore, the Commandant (G-OCA) Aviation Life Support Requirements Manager and ARSC Aviation Life Support Systems Manager must closely coordinate their efforts to ensure that this mission critical requirement is properly funded, stocked, and issued to operational aviation units.

C. EQUIPMENT TYPES. There are two types of ALSE which align with AFC-30 and AFC-41 guidelines. Commandant (G-OCA) and Commandant (G-SEA) will determine the equipment type which will dictate the type of support funding. The examples given are not inclusive and are only intended to provide general guidance.

1. Personal/deployable ALSE. Equipment that is individually issued to aircrewmembers or deployed from the aircraft for rescue. This does not include Rescue Swimmer physical training uniforms or deployment ensembles which, although supported with AFC-30, are managed solely by the Commandant (G-OCA) Rescue Swimmer Program Manager IAW the Helicopter Rescue Swimmer Manual, COMDTINST M3710.4 (series).

   a. AFC-30 provides funding support for this equipment.

   b. Responsibility: Commandant (G-OCA) is responsible for establishing the operational requirement and obtaining initial funding. ARSC is responsible for acquisition, implementation, storage, issue, technical support, modification, and superseding equipment.

   c. Examples: Aircrew Dry Coveralls, Flight Suits, Flight Helmets, Flight Jackets, Rescue Swimmer Harnesses, Air Delivery Systems, Dewatering Pumps.

   d. Storage: Personal/deployable ALSE may be stored by Coast Guard Inventory Control Points (ICP) that operate using AFC-30, or by the vendor in bonded storage. The Financial Resources Management Manual, COMDTINST M7100.3 (series), specifically prohibits storage of personal/deployable ALSE using AFC-41.

2. Aircraft ALSE. Equipment that is part of the aircraft configuration or that is listed in the Air Operations Manual, COMDTINST M3710.1 (series), as the minimum required rescue/survival equipment for the aircraft type.

   a. AFC-41 provides funding support for this equipment.

   b. Responsibility: Commandant (G-OCA) is responsible for establishing the operational requirement and obtaining initial and out year funding. ARSC is responsible for acquisition, implementation, storage, issue, technical support, modification, and superseding equipment.

   c. Examples: Rescue Litters, Rescue Baskets, Oxygen Masks, Life Rafts, Survival Vests, Survival Radios, Personnel Parachutes.

   d. Storage: Aircraft ALSE is stored by ARSC or by the vendor in bonded storage.

D. ORGANIZATION.

1. Commandant (G-OCA) is the Aviation Life Support Requirements Manager. As such, Commandant (G-OCA) sets the operational requirements for ALSE.

2. Commandant (G-SEA) maintains liaison with Commandant (G-OCA) for operational requirements and funding issues, Commandant (G-WKS) for flight safety related ALSE deficiencies, and ARSC for project management and technical support. Commandant (G-SEA), Commandant (G-OCA), Commandant (G-WKS), and ARSC jointly review and prioritize ALSE issues.

3. ARSC is the Aviation Life Support Systems Manager. As such, ARSC acts as the project manager for new ALSE acquisitions, and manages in-service ALSE as described above by equipment type. The Aviation Life Support Systems Manager receives tasking from Commandant (G-SEA).

4. ATC Mobile is the ALSE Prime Unit. As such, ATC Mobile is responsible for technical responsiveness to field level ALSE maintenance managers. The ALSE Prime Unit receives tasking from ARSC, and functions as a Prime Unit as outlined in Chapter 2. of this manual.

ENCLOSURE INDEX

MAINTENANCE LEVEL FUNCTIONS

A. APPLICABLE NOTES. These notes apply throughout this enclosure when a number is indicated as applying to a maintenance level:

1. When removal of components is required and disassembly of aircraft components is involved or light installed job-shop type equipment is required, the function is classified to the C level.

2. When removal of components is required, but disassembly of aircraft components is not involved, and semi-portable or bench-type equipment is required, the function is classified to the D level.

3. Participation in the Joint Oil Analysis Program or Spectrometric Oil Analysis Program (HU-25) is mandatory for certain components and optional for others. All units must maintain oil sampling equipment on board.

B. AIRCRAFT GENERAL. Maintenance functions applicable to the aircraft in general are classified as follows:

1. Upkeep Inspections

	CLASS	
	C	D
a. Pre flight	-	X
b. Thru- flight	-	X
c. Post flight	-	X
d. Computerized	-	X
e. Special	-	X
f. Acceptance and transfer	-	X
g. Inventory	-	X

2. Preservation

a. 5 to 10 days	-	X
b. 11 to 30 days	-	X
c. 31 to 60 days	-	X

3. Machine Operations (Metal and Metal Machine Work Plate, Bar, Sheet, Tubing, Rod, Wire, and Cable)

	CLASS	
	C	D
a. Shaping operations	1	-
b. Drilling operations	1	2
c. Milling operations	1	-

		CLASS	
		C	D
d.	Turning operations	1	-
e.	Cutting operations	1	2
f.	Grinding operations	1	2
g.	Pressing operations	1	2
h.	Sawing operations	1	2
i.	Forming operations	1	2
j.	Bending operations	1	2
k.	Flaring operations	1	2
l.	Beading operations	1	2
m.	Punching operations	1	2
n.	Shrinking operations	1	2
o.	Stretching operations	1	2
p.	Dimpling operations	1	2
q.	Riveting operations	1	2
r.	Welding operations	1	2
s.	Spinning operations	1	-
t.	Shearing operations	1	2
u.	Swaging operations	1	2
v.	Rolling operations	1	2
w.	Filing operations	1	2

4. Cable, Tube, and Rod Work (Controls)

		CLASS	
		C	D
a.	Inspect installed	-	X
b.	Functional test	-	X
c.	Tensioning	-	X
d.	Remove and replace cables, tubes, and rods	-	X
e.	Manufacture, swage, and test cables	1	-

		CLASS	
		C	D
5.	Welding and Soldering		
	a. Oxyacetylene welding and cutting	1	2
	b. Electric arc	1	2
	c. Electric inert arc	1	2
	d. Soldering	-	X
6.	Painting		
	a. Strip and refinish subassemblies	X	-
	b. Strip and refinish parts	-	X
	c. Brush and spray touch-up on aircraft	-	X
	d. Paint identification markings on aircraft	-	X
	e. Paint identification markings on components	-	X
	f. Apply acid proof paint	-	X
7.	Cleaning		
	a. Wash aircraft	-	X
	b. VCU-Blast corrosion on airframe and components	X	-
8.	Examination and Testing		
	a. Magnetic particle process, installed or portable equipment	-	X
	b. Fluorescent process, installed or portable equipment	-	X
	c. Dye penetrant process	-	X
	d. Radiographic (X -ray) process	X	-
	e. Eddy current process	-	X
	f. Ultrasonic process	X	-
	g. Hardness test process		
	(1) Installed equipment	X	-
	(2) Semi-portable equipment	X	-
	(3) Portable equipment	-	X

9. Miscellaneous

	CLASS C	CLASS D
a. Joint Oil Analysis Program (JOAP) sampling	-	3
b. Spectrometric Oil Analysis Program (SOAP) (HU-25) sampling	-	3
c. Maintaining spare aircraft assigned to specific stations by the Commandant	-	X

C. AIRFRAMES SYSTEMS AND COMPONENTS.

1. Airframes components include the fuselage, wings, fixed surfaces, movable surfaces, boost units, cockpits, seats, fairings, access doors, flight control attachment fittings, bearings, bell cranks, chains, cables, drums, fairleads, torque tubes, pulleys, quadrants, rigging rods, associated rollers and sprockets, control wheels, rudder pedals, surface control locks, all technical controls (see Instrument System), trim tab controls, cargo hoists, and related airframe items.

2. Maintenance functions applicable to airframes components are classified as follows:

	CLASS C	CLASS D
a. Inspection (routine and special)	-	X
b. Inspection (removed components)	-	X
c. Pre flight line test of airframe systems, flight and mechanical controls	-	X
d. Servicing and lubrication	-	X
e. Adjust linkage, controls, cables, etc.	-	X
f. Removal of strainers, filters, fasteners, safety wire, etc.	-	X
g. Removal and installation of components	-	X
h. Repair of components		
(1) By replacement of parts easily accessible. Component removal not required	-	X
(2) By replacement of parts which require component removal. Bench test may or may not be required	-	X
(3) By replacement of parts which usually require extensive component disassembly or special tools or support equipment. Subsequent to repair, functional testing and quality assurance inspections are normally required	X	-

		CLASS C	CLASS D
i.	Repair of structural damage	1	2
j.	Incorporation of aircraft changes	1	2

3. Landing gear components include the main, nose and tail gear, skis, amphibious gear and otation equipment, retracting mechanism controls, gearboxes, valves, struts, shimmy dampers, warning and position indicating transmitters, doors, door actuating struts, ground steering mechanisms, wheels, brakes, tires and tubes, and associated lines and fitting.

4. Maintenance functions applicable to landing gear components are classified as follows:

		CLASS C	CLASS D
a.	Inspection (routine and special)	-	X
b.	Inspection (components removed)	-	X
c.	Servicing and lubrication	-	X
d.	Removal and replacement of components (strut actuators, shimmy dampers, brake assemblies, etc.)	-	X
e.	Functional test by cycling	-	X
f.	Repair of components	X	-
	(1) By replacement of easily accessible parts. Component removal not required		
	(2) By replacement of high usage parts which require component removal. Bench test may not be required	-	X
	(3) By replacement of high or low usage parts requiring extensive component disassembly, or support equipment. Subsequent to repair, functional testing or quality assurance inspection is normally required	X	-
g.	Bench test of components	X	-
h.	Incorporate aircraft changes	1	2
i.	Repair of damage	1	2

5. Hydraulic/pneumatic components include hydraulic pumps, air compressors, fluid reservoirs, pressure accumulators, booster pumps, relief valves, check valves, pressure warning transmitters, over ows, vents, and associated lines and fittings.

6. Maintenance functions applicable to hydraulic/pneumatic components are classified as follows:

		CLASS C	CLASS D
a.	Inspection (routine and special)	-	X
b.	Servicing	-	X
c.	Removal and replacement of filters and strainers, etc.	-	X
d.	Removal and replacement of components (pumps, air compressors, accumulators, relief valves, etc.)	-	X
e.	Functional test of system or subsystem. Ground support equipment may or may not be required	-	X
f.	Repair of components		
(1)	By replacement of seals, gaskets, packing, standard fitting, etc. Component removal not required	-	X
(2)	By replacement of high usage standard hardware, seals, gaskets, packing, fittings, and parts which require component removal and minor disassembly. Bench test may or may not be required	-	X
(3)	By replacement of high or low usage repair parts requiring extensive component disassembly or special tools, quality assurance inspection normally required	X	-
g.	Flex lines and rigid tubing		
(1)	Fabrication and testing **NOTE:** Low pressure and medium pressure (1500 PSI) hose assemblies (including teflon) may be manufactured at unit level in accordance with AFTO 42E1-1-1. Preformed and high pressure hoses (3000 PSI) will be procured in accordance with existing instructions.	-	X
h.	Incorporate aircraft changes	1	2
i.	Repair of damage	1	2

7. Utility components include complete heating, ventilating, pressurization, anti-icing and deicing (except propeller and rotors), fire extinguishing system components; associated fuel filters, fuel pressure regulators, fuel pumps, fuel pressure transmitters, dampers, anemostats, thermistors, cabinstats, air distribution controls, ducts, packing, cabin air filters and filtering elements, cabin air pressure regulators, valves, quick disconnect blocks, windshield defrosters, warning system components, reservoirs, vacuum pumps, filters, controls, engine fire extinguisher cylinders, associated lines and fittings.

8. Maintenance functions applicable to utility components are classified as follows:

		CLASS C	CLASS D
a.	Inspection (routine and special)	-	X
b.	Servicing and lubrication	-	X
c.	Removal, cleaning, and replacement of filters, strainers, packing, insulation, etc.	-	X
d.	Removal and replacement of components (heaters, motors, pressure regulators, transmitters, etc.)	-	X
e.	Functional test of systems or subsystems	-	X
f.	Repair of components		
	(1) By replacement of seals, gaskets, packing, standard fittings, etc. Component removal not required	-	X
	(2) By replacement of high usage standard hardware, seals, gaskets, packing, fittings, and parts which require component removal and minor disassembly. Bench test may or may not be required	-	X
	(3) By replacement of high or low usage repairs requiring extensive component disassembly, or special tools or shop equipment. Subsequent to repair, functional testing or quality assurance inspection normally required	X	-
g.	Incorporate aircraft changes	1	2
h.	Repair of damage	1	2

9. Safety and survival components include seat belts, shoulder harnesses, inertia reels, oxygen cylinders, liquid oxygen converters, regulators (except miniature mask mounted), lines, connections and fittings, portable fire extinguisher, rescue slings, baskets, litters, water bottles, and mounting brackets.

10. Maintenance functions applicable to safety and survival components are classified as follows:

		CLASS C	CLASS D
a.	Pre flight, thru- flight, post flight inspection and servicing	-	X
b.	Ground test of equipment and systems	-	X
c.	Minor adjustments of equipment and systems	-	X
d.	Removal and replacement of components	-	X
e.	Functional test and adjustment of safety and survival equipment and systems using portable or mobile test equipment	-	X

	CLASS C	CLASS D
f. Routine inspections of removed aviator's equipment and systems	-	X
g. Bench test of safety and survival components	-	X
h. Repair of components		
(1) By replacement of parts easily accessible. Component removal not required	-	X
(2) By replacement of high usage standard parts which require component removal and minor disassembly. Bench test may or may not be required	-	X
i. Complete repair of components	X	-
j. Incorporate changes and modifications	1	2

D. AVIONICS SYSTEM AND COMPONENTS. Avionics Systems Components include the following:

NOTE

LRUs under warranty do not apply.

1. Transmitting, receiving; radar (navigation and search), recognition (IFF), Loran, radio range, radio compass, radio altimeter, marker beacon, runway localizer, glide path, antennas, cables, wires, control panels, headsets, microphones and switches, infrared, data transmission, data analysis and recorders.

2. Electrical, aircraft power distribution; generators, inverters, motors, reverse current relays, voltage regulators, over-voltage relays, warning lights and test switches, junction boxes, batteries, battery vent system units, installed auxiliary power unit (generator only). Landing, recognition, navigation and approach lights; compartment, cockpit, and cabin lights, ood and trouble lights, electric actuators and electric portions of airframes and engine accessories.

3. Engine, flight, navigation; quantity, pressure, position, vacuum instruments; automatic pitot and stabilization units, pitot and static system units, lift computers, stall warning devices and fire detecting units (except elements installed in engine compartments); instrument panels and lights and associated regulators, pumps, lines, and connections.

4. Maintenance functions applicable to avionics components are classified as follows:

	CLASS C	CLASS D
a. Pre flight, thru- flight, post flight inspection and servicing	-	X
b. Functional test and adjustment of installed systems components	-	X
c. Removal and replacement of minor components	-	X
d. Removal and replacement of system major components	-	X
e. Routine inspection of systems	-	X

		CLASS C	CLASS D
f.	Routine inspection of removed components	-	X
g.	Bench test of system components	-	X
h.	Repair of components		
(1)	By replacement of parts of subassemblies without removal of unit from the aircraft	-	X
(2)	By replacement of parts, subassemblies, and mechanical components. (Repair of subassemblies and mechanical components by replacement of parts is included in this function)	-	X
(3)	No repair functions are assigned to the C level; however, certain maintenance or repair functions for selected and identified avionics items may be appropriately assigned to the Class C level due to facility and tooling requirements	-	-
i.	Incorporate changes and comply with bulletins	-	X

NOTE: For repair functions for avionics support equipment (bench harnesses, simulators, and test equipment) refer to paragraph I.

E. ORDNANCE SYSTEMS AND COMPONENTS.

1. Ordnance components include loading equipment, pyrotechnic ejectors and launchers, and jato units.

2. Maintenance functions applicable to ordnance components are classified as follows:

		CLASS C	CLASS D
a.	Pre flight, thru- flight, post flight inspection and servicing	-	X
b.	Ground test of ordnance systems	-	X
c.	Minor adjustments of ordnance system components	-	X
d.	Removal and replacement of strainers, filters, safety wire, fasteners, etc.	-	X
e.	Functional test and adjustment of ordnance system components	-	X
f.	Periodic inspection of ordnance systems	-	X
g.	Preservation		

	CLASS C	CLASS D
(1) 5 to 10 days	-	X
(2) 11 to 30 days	-	X
(3) 31 to 60 days	-	X
h. Repair of ordnance accessories	-	X
(1) Replacement of parts which do not require removal or bench test	-	X
i. Incorporate armament changes and comply with armament bulletins	-	X

F. PHOTOGRAPHIC SYSTEMS AND COMPONENTS.

1. Photographic components include cameras, view finders, associated controls, solenoids, indicator lights, switches, vacuum pumps, heaters, window washer, and intervalometers.

2. Maintenance functions applicable to photographic components are classified as follows:

	CLASS C	CLASS D
a. Inspection (routine and special)	-	X
b. Inspection (removed components)	-	X
c. Pre flight line test of photographic systems and components	-	X
d. Servicing, lubrication, adjustment, and replacement of film and consumables	-	X
e. Functional test and adjustment of photographic systems and components	-	X
f. Removal and installation of components	-	X
g. Bench test of photographic components	-	X
h. Repair of components	-	X
(1) By replacement of parts easily accessible. Component removal not required	-	X
(2) By replacement of high usage standard parts which require component removal. Bench test may or may not be required	X 1	- 2
i. Incorporate photographic service changes and comply with photographic bulletins		

G. POWER PLANT EQUIPMENT AND SYSTEMS. Power plant and related system components include the following:

1. Engine, engine mounts, engine control quadrant, cables, rods, pulleys, and fair-leads; injection pumps, oil strainers, valves, baf es, anti-drag, cowl aps, cowl ap actuating mechanisms and indicating transmitters, permanently installed auxiliary power units (engine only), engine driven pumps, lines, filters and filter body (from engine manifold only); fuel and oil pressure switches and transmitters, fire detecting elements, burner baskets, main bearing supports, tail pipes, compressors, diffusers, turbines, engine anti-icing systems, main fuel pumps, engine driven fuel boost pumps, inlet guide vane actuators, variable stator actuators, fuel distributers, fuel nozzles, fuel/oil heat exchangers, torch ignitors, air bleed governors, emergency fuel systems, and starters.

2. Tanks, coolers, cooler door actuating mechanisms and indicating transmitters, filters, regulators, transfer pumps, relief valves, heat exchangers, oil dilution solenoids and valves, temperature bulbs, tank sumps, lines, hoses, and fittings.

3. In-line engine cooling tanks, radiators, after-coolers, expansion tanks, pumps, thermometers, relief valves, heat exchangers, header tanks, lines, hose and fittings, engine cooling fans.

4. Fuel tanks (wing, fuselage, droppable), fuel quantity tank units, master fuel shutoff valves, selector valves, booster pumps, fuel pumps, strainers, vents, primers, water injection tank, pumps, time delay relays, pressure switches, regulators; associated lines and fittings (to the engine manifold only).

5. Maintenance functions applicable to power plant and related system components are classified as follows:

	CLASS	
	C	D
a. Pre flight, thru- flight, and post flight inspection	-	X
b. Ground test of power plant system	-	X
c. Minor adjustments of power plant system components	-	X
d. Removal or replacement of strainers, filters, safety wire, etc., which are easily accessible	-	X
e. Inspections of power plant systems (power plant installed or removed)	-	X
f. Functional test and adjustment of power plant and systems (power plant installed)	-	X
g. Removal and replacement of power plant system components (engine, accessories, propellers, rotors, etc., power plant removed)	-	X
h. Removal and replacement of power plant system components (engines, accessories, propellers, rotors, etc., power plant installed)	-	X
i. Assemble quick change assemblies (engine build-up)	-	X
j. Preservation of uninstalled power plant		
(1) 11 to 30 days short term	-	X
(2) For shipment	-	X

	CLASS C	CLASS D
k. Repair and bench test power plant accessories (all type power plants)		
(1) Replacement of external parts, linkages, etc., such that the accessory does not require disassembly or bench test	-	X
(2) Replacement of any components or parts which require disassembly and bench test of the accessory or subassembly	X	-
l. Repair gas turbine engines		
(1) Minor repair of installed engines	-	X
(2) Repair of removed engines by replacement of parts (disassembly as authorized for the specific engine model)	-	X
(3) Major repair removed engines, not including disassembly of rotating assemblies which require balancing after reassembly, or major units authorized only for "complete repair"	X	-
m. Incorporate engine changes	1	2

6. Propellers and related system components include propellers, blades, hubs, governors, spinners, feathering control motors, brushes, deicing and anti-icing fixed components, slinger rings, nozzles, and shoes.

7. Maintenance functions applicable to propeller and related system components are classified as follows:

	CLASS C	CLASS D
a. Pre flight, thru- flight, post flight inspection	-	X
b. Ground test of propeller systems	-	X
c. Minor adjustment of propeller system components	X	-
d. Routine and special inspection of propeller system and components	-	X
e. Removal and replacement of propellers and system components	-	X
f. Preservation for shipment	-	X
g. Propeller assembly and disassembly	-	X
h. Repair and bench test of propeller and components		

		CLASS C	CLASS D
(1)	Repair by replacement of parts easily accessible. Propeller or component removal not required	-	X
(2)	Functional test of propeller and components using propeller and governor test bench. No repair by replacement of internal parts authorized (electrical components will be repaired under provisions of paragraph D)	-	X
(3)	Repair by replacement of components or parts which require component removal. Extensive disassembly or special tools or support equipment may be required. Subsequent to repair, functional testing and quality assurance inspections are normally required	X	-
(4)	Deicer boot replacement and propeller balancing changes	X	-
i.	Incorporate propeller changes	1	2

8. Rotary wing dynamic drive systems and components include blades, heads, hubs, antiapping and anticoning devices, anti-icing and deicing attached fixed component, snubbers, dampers and related reservoirs and lines, controls and linkage; drive shafting, universals and exible couplings, transmissions, gear boxes, free wheeling units, vibration absorbing couplings, clutch assemblies, and rotor brakes.

9. Maintenance functions applicable to rotary wing dynamic drive system and components are classified as follows:

		CLASS C	CLASS D
a.	Pre flight, thru- flight, post flight inspections	-	X
b.	Ground testing, blade tracking, minor rigging adjustment	-	X
c.	Removal or replacement of strainers, filters, safety wire, easily accessible	-	X
d.	Routine and special inspection of dynamic system components	-	X
e.	Servo timing, system rigging, adjustment of reinstalled system components	-	X
f.	Removal and replacement of components and accessories	-	X
g.	Build-up of quick change assemblies	-	X
h.	Repair of components		

	CLASS C	CLASS D
(1) By replacement of seals, gaskets, packing, standard fittings, etc., (component removal not required)	-	X
(2) By replacement of high usage standard hardware, seals, gaskets, packing, fittings, and parts which require component removal and minor disassembly. Bench test may or may not be required	-	X
(3) By replacement of high or low usage repair parts requiring extensive component disassembly, or special tools or shop equipment. Subsequent to repair, functional testing or quality assurance inspection normally required	1	2

H. AVIATOR'S EQUIPMENT AND SYSTEMS.

1. Aviator's equipment includes parachutes, harnesses, life rafts, life vests, oxygen masks, suspension straps, emergency equipment kits, flight clothing, oxygen regulators (miniature mask mounted), PRC Series transmitters, and helmets.

2. Maintenance functions applicable to aviator's equipment are classified as follows:

	CLASS C	CLASS D
a. Pre flight, thru- flight, post flight inspection	-	X
b. Ground test of aviator's equipment and systems	-	X
c. Minor adjustments of aviator's equipment and systems	-	X
d. Removal and replacement of minor components	-	X
e. Routine and special inspections of aviator's equipment and systems	-	X
f. Functional test and adjustment of aviator's equipment and systems using portable or mobile test equipment	-	X
g. Removal and replacement of aviator's equipment and systems major components	-	X
h. Routine and special inspections of removed aviator's equipment systems	-	X
i. Bench test of aviator's equipment	-	X
j. Repair of components		
(1) By replacement of parts easily accessible	-	X

		CLASS C	CLASS D
(2)	By replacement of high usage standard parts which require equipment removal and minor disassembly. Bench test may or may not be required	-	X
(3)	By replacement of high or low usage parts requiring extensive component disassembly or special tools or support equipment. Subsequent to repair, functional testing or quality assurance inspection is normally required	-	X
k.	Incorporate changes	1	2

I. AIRCRAFT MAINTENANCE SUPPORT EQUIPMENT.

1. For the purpose of classifying maintenance functions for the maintenance and repair of aircraft maintenance support equipment, the following categories of equipment have been established:

   a. Avionics support equipment

   b. Gasoline, electric, and diesel powered servicing equipment

   c. Gas turbine powered servicing equipment

   d. Trailers, dollies, and carts (non-powered)

   e. Mechanical support equipment

2. Maintenance of support equipment is based upon ownership. The owner is responsible for ensuring proper maintenance.

3. Avionics support equipment includes electronic test sets; simulators, voltage, current, power, waveform measuring equipment and electromechanical devices such as rate tables, vacuum-pressure testers, temperature and fuel quantity indicator test sets, blade trackers, etc.

4. Maintenance functions applicable to avionics support equipment are classified as follows:

		CLASS C	CLASS D
a.	Operational check and test	-	X
b.	Routine servicing	-	X
c.	Minor adjustment and removal and replacement of minor components and parts (knobs, safety wire, fuses, light bulbs, etc.)	-	X
d.	Removal and replacement of major components, parts, subassemblies, and modules	-	X
e.	Repair of components by replacement of parts (tubes, transistors, resistors, etc.)	-	X

		CLASS C	CLASS D
f.	Bench test of components	-	X
g.	Repair of sealed or potted units, subassemblies or modules, high precision mechanical components and units requiring special chemical treatments, sealing, or finishes	-	-
h.	Calibration	-	X
i.	Incorporate authorized modifications or changes	1	2

NOTE: Calibration will be in accordance with paragraph 9.H. and paragraph 11.E.2.c.

5. Gasoline, electric, and diesel powered servicing equipment includes equipment such as air compressors, hydraulic stands, mobile air conditioners, mobile electric power plants, ood light trailers, etc. (not including turbine powered equipment).
6. Maintenance functions applicable to gasoline, electric, and diesel powered servicing equipment are classified as follows:

		CLASS C	CLASS D
a.	Pre-operation, post-operation, and daily inspection	-	X
b.	Servicing and daily maintenance	-	X
c.	Removal and replacement of minor parts (light bulbs, fuses, batteries, filters, cables, tires, spark plugs, fan belts, etc.)	-	X
d.	Periodic inspection and maintenance	-	X
e.	Preventive maintenance lubrication, oil change, tune-up, adjust brakes, road test, etc.	-	X
f.	Remove, replace, repair, and test nonautomotive components (pumps, gages, generators, etc.)	-	X
g.	Remove and replace automotive components	-	X
h.	Minor repair to body fenders, frame, housing, etc., including straightening, welding, repainting, etc.	-	X
i.	Repair and test automotive components (on or off vehicle). Includes pumps, valves, gages, tubing, carburetor, ignition, brake relining or replacement, brake cylinder rebuilding, generators, etc.	-	X
j.	Incorporate authorized modifications or changes and comply with bulletins	1	2

7. Gas turbine powered servicing equipment includes equipment such as GTC-85, (including pad or enclosure) PP-105, MA-1A, etc.

8. Maintenance functions applicable to gas turbine powered servicing equipment are classified as follows:

		CLASS C	CLASS D
a.	Pre-operation, post-operation, and daily inspection	-	X
b.	Servicing and daily maintenance as published on Maintenance Requirements Cards	-	X
c.	Adjustment, removal and replacement of components and parts	-	X
d.	Removal and replacement of gas turbine engine	-	X
e.	Periodic inspection and maintenance	-	X
f.	Functional test and adjustment of complete unit (as a complete assembly)	-	X
g.	Preservation of gas turbine engine	-	X
h.	Repair and bench test of components and accessories	-	X
i.	Repair and repaint enclosure	-	X
j.	Repair of removed gas turbine engines (not to include disassembly of rotating assemblies which require balancing or extensive testing of components after reassembly)	-	X
k.	Incorporate authorized modifications or changes	1	2

9. Trailers, dollies, and carts (non-powered) include equipment such as engine removal and transportation trailers, cryogenic servicing trailers, crash dollies, wheel removal dollies, preservation carts, weighing scales, water-alcohol trailers, shipment stands, engine test stands, etc.

10. Maintenance functions applicable to trailers, dollies, and carts (non-powered) equipment are classified as follows:

		CLASS C	CLASS D
a.	Pre-operation, post-operation, and daily inspection	-	X
b.	Servicing and daily maintenance	-	X
c.	Minor adjustment, removal and replacement of minor parts	-	X
d.	Periodic inspection and maintenance	-	X
e.	Removal and replacement of components	-	X
f.	Test components (on or off vehicle)	-	X

		CLASS C	CLASS D
g.	Repair components (on or off vehicle)	-	X
h.	Metal work straightening, welding, repainting, etc.	-	X
i.	Incorporate authorized modifications or changes and comply with bulletins	1	2

11. Mechanical support equipment includes equipment such as jacks, work stands, hoists, tow bars, hoisting slings, adapters, ladders, fixtures, wheel chocks, portable tools, tie-downs, analyzers, line testers (other than avionics), etc.

12. Maintenance functions applicable to mechanical support equipment are classified as follows:

		CLASS C	CLASS D
a.	Pre-operation, post-operation, and daily inspection	-	X
b.	Servicing and daily maintenance	-	X
c.	Minor adjustment, removal and replacement of minor parts	-	X
d.	Periodic inspection and maintenance	-	X
e.	Removal and replacement of components	-	X
f.	Test components (on or off vehicle)	-	X
g.	Repair components (on or off vehicle)	-	X
h.	Metal work straightening, welding, repainting, etc.	-	X
i.	Calibration of selected equipments	-	X
j.	Overhaul components or complete equipment	-	X
k.	Incorporate authorized modifications or changes and comply with bulletins	1	2

LOGISTICS COMPLIANCE INSPECTION (LCI) WORKSHEET

A. **SUPPLY.** The LCI representatives will complete the following items during their inspection:

1. Check all Type 1, 2, and 4 items in the warehouse with an extended price over $5000.00.

2. Check all Type 1, 2, and 4 items in remote locations with an extended price over $5000.00.

3. Conduct a random sample of physical inventory in the warehouse.

4. Research discrepancies between AMMIS and the physical inventory to reconcile differences and determine the source of the discrepancy.

5. Check for Unit of Issue discrepancies, count and adjust balances. (Common problem at units.)

6. Identify Local Order Number with status code "A5A" and take corrective action to clear these. Ensure inventory count is correct.

7. Identify "Bogus" locations in both AMMIS and at the station. Take corrective action.

8. Review the following reports to identify requisitions and unserviceable turn-ins and the dates they were submitted.

    a. Cumulative Turn-In Report

    b. Requisition Status Report

    c. Commanding Officer's Report

9. Provide training in "Air Station Supply Procedures." This mini-course is a refresher in the procedures to obtain, account for, return and troubleshoot aviation supply items using AMMIS.

10. Provide training for managers in "Air Station Procedures." This mini-course is a refresher for managers in the review of AMMIS reports, what the reports mean to the availability of parts, and how to improve our supply process.

11. Conduct inspection of maintenance shops.

    a. Are shops properly handling accountable materiel? Are items found in the shops A Condition on AMMIS, bound for an aircraft, or "off book?"

    b. Conduct a random sample of physical inventory at remote storage locations. Reconcile inventory to AMMIS and vice versa.

    c. Interview mechanics to determine if they understand the system and their responsibilities in accounting for aviation materiel.

    d. Resolve any discrepancies found and assist where needed or requested.

B. **PERSONNEL.** List your aviation enlisted and commissioned officer billets authorized and actual personnel on board. Are they adequate?

C. **TRAINING.** Are you satisfied with the quality of training our "A" and "C" School graduates receive? What recommendations do you have to improve the quality of our training? Are enough quotas available to meet your requirements?

D. **PROFESSIONAL/CAREER DEVELOPMENT.** Do you have any personnel interested in pursuing graduate degrees in Management, Engineering, Avionics, or Management Information Systems? Do you have any questions on career paths? Do you have any recommended improvements to the Student Engineering Officer syllabus? What is the status of any students assigned?

E. **AFC-30 FUNDING.** What is your AFC-30 base? List your Engineering and Avionics annual budgets. List Type 3 and Type 5 as separate entities. Compare funding availability to requirements and briefly describe how this has impacted your Engineering Department.

F. **INFORMATION SYSTEM (IS) RESOURCES (I.E., AMMIS, ACMS, TIMOS, CG-22 GENERATION/TRACKING SYSTEM).** How are the IS resources working for you? Have you had any performance or functionality problems? Do you have any suggestions for improvement?

G. **AIRCRAFT CONDITION**. Evaluate the condition of each of your aircraft, paying particular attention to configuration and corrosion. Indicate whether any aircraft require an accelerated induction into PDM (include justification) or could be a candidate for delayed PDM induction.

H. **MAINTENANCE SUPPORT PROGRAMS**. Does your maintenance program deviate from the guidelines of Chapter 9. of COMDTINST M13020.1 (series)? If so, how?

I. **CORROSION CONTROL PROGRAM**. Does your maintenance program deviate from the GUIDE-LINES in the Corrosion Control Process Guide, PG-85-00-60, paragraph B? If so, how? Who is your Corrosion Prevention Advocate (CPA)? List training he/she has provided during the last year. Provide a copy of current unit corrosion control plan. Did any carried forward (CF) discrepancies or maintenance discrepancies (squawks) remain open beyond 30 days without approval from the unit Engineering Officer? Provide any recommended changes to the Corrosion Control Process Guide, CGTO PG-85-00-60.

J. **MAINTENANCE SAFETY**. Describe any deviations from the practices outlined in Chapter 12. of COMDTINST M13020.1 (series).

K. **NOT MISSION CAPABLE (NMC) RATES**. During the previous 12 months, what have been the top five mission degraders? What were your three longest NMC periods (how many days) and what was the cause?

L. **CANNIBALIZATION**. Briefly describe your cannibalization procedures. What is your cannibalization rate by aircraft type (i.e., cannibalization events per aircraft per month...cannibalization/aircraft/ month)?

M. **UNSATISFACTORY REPORTS (URS)**. List the URs your unit submitted last FY and this FY to date. Use the format Type/Title/Date. Do you receive adequate feedback and/or response to submitted URs?

N. **CG-22S**. List the CG-22s submitted by your unit last FY and this FY to date. Do you receive adequate feedback and/or response to submitted CG-22s?

O. **TIME COMPLIANCE TECHNICAL ORDERS (TCTOS) AND MAINTENANCE ADVISORIES**. Are TCTOs and Maintenance Advisories clearly written? Do you have adequate time and logistic support to comply with TCTOs? Are the kits that are issued with TCTOs adequately prepared?

P. **TECHNICAL PUBLICATIONS**. Are your technical publications adequate? Do your personnel have proper training in the ordering of publications and maintaining a library? What technical publications need revision (cite specific shortcomings)?

Q. **POST PROGRAMMED DEPOT MAINTENANCE (PDM) AIRCRAFT**. List aircraft received over the last 12 months. Describe your satisfaction with the quality of the aircraft received from PDM.

R. **EQUIPMENT CALIBRATION PROGRAM**. Attach the latest calibration Due/Status Report. Is your calibration program meeting your needs? How can we improve the program?

S. **AVIONICS TRACKING SYSTEM (ATS)**. How has implementation of ATS affected the way you manage avionics? Have you had any performance or functionality problems with the ATS subsystem? How can we improve the process?

T. **CTS-81 UTILIZATION**. Does your avionics maintenance program call for verification of all serviceable LRUs received from ARSC and vendors? Do you fault verify/confirm unserviceable LRUs prior to shipment? Do you receive adequate CTS-81 support?

U. **GROUND SUPPORT EQUIPMENT (GSE)**. Assess the overall condition of your GSE. List specific GSE that you need, but don't have. What are your projected needs over the next 5 years? Do you have GSE or test equipment that is underutilized or for which your personnel are inadequately trained in the use or maintenance of?

V. **AVIATION COMPUTERIZED MAINTENANCE SYSTEM (ACMS)**. What ACMS reports do you run on a standard basis? What difficulties do you have with ACMS? What is the normal interval of your Maintenance Due List (MDL)? How frequently do you run a new Status Report and Aircraft Configuration Report?

W. **AIRCRAFT SALVAGE**. Attach the latest edition of your unit salvage plan. When was it last reviewed? When was your last salvage drill?

X. **POLLUTION PREVENTION**. Briefly describe any Hazardous Materiel Management issues your department is involved in (i.e., disposal, paint booth, fuel farms, etc.).

Y. **PROJECTS**. Describe major ongoing or planned projects that affect your department.

Z. **MEASURES**. List process measures your department uses or is in the process of developing. How have these helped you to identify process improvements?

AA. **CONCERNS**. List any additional concerns you would like addressed during the Aeronautical Engineering Logistics Compliance Inspection.

ENCL (3) TO COMDTINST M13020.1E

SAMPLE TCTO

U.S. COAST GUARD AVIATION COMPUTERIZED MAINTENANCE SYSTEM	HH–60 000000.0 REV'D 00/00/97

AIRCRAFT NUMBER	OPERATING ACTIVITY	MAINTENANCE ACCOMPLISHED				MAINTENANCE DUE			
		DATE			A/C HOURS	DATE			A/C HOURS
		MO	DAY	YEAR		MO	DAY	YEAR	

ITEM ☐ DUE	CMS CODE	ACTION	DESCRIPTION	CEINUM
	000000	MODIFY	EXAMPLE TCTO SIGNOFF	60–0000–001

☒ SCHEDULED ☐ UNSCHEDULED

COMPONENT SERIAL NO. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

DISCREPANCIES FOUND: NO____ YES____

MAN HOURS : AMT_____.__ AVT_____.__ AST_____.__ OTHER_____.__

REMARKS: _____

TECHNICIAN'S SIGNATURE _____ TECHNICIAN'S ID _____

✳ ASTERISK INDICATES QA REQUIRED	QA (1)	QA (2)	QA (x)							

IMMEDIATE ATTENTION REQUIRED

TIME COMPLIANCE TECHNICAL ORDER

TCTO H60–000000

DESCRIPTION OF ACTION TO BE ACCOMPLISHED AND SIGNED OFF BY THIS TIME(OR SPECIAL) COMPLIANCE TECHNICAL ORDER

REVIEWED BY	LOG YN	DATA ENTRY COMPLETED	WEIGHT AND BALANCE OFFICER'S SIGNATURE	UNIT DOCUMENT NUMBER

REFERENCES
XX–XXXX–XXXXXX

Page 1 of ##

TCTO H65-9XXXXX
ARSC W.O. No. XXXX

1. **APPLICATION.**
This technical order is applicable to all Coast Guard HH-65A aircraft.

2. **PURPOSE.**

a. This technical order directs the visual inspection of the aft side of the left 14 degree frame (near the leather hand hold) for cracks or a previously installed doubler.

b. This TCTO also provides for the installation of a doubler on aircraft that have not been previously modified.
NOTE: Parts will only be ordered for aircraft in which doubler has not been previously installed.

3. **TCTO COORDINATOR.**
Technical questions or comments associated with this TCTO should be referred to HH-65A Technical Services, telephone number (919) 335-6210, fax number (919) 335-6463.

4. **WHEN TO BE ACCOMPLISHED.**
Within 180 days after receipt of this TCTO.

5. **BY WHOM TO BE ACCOMPLISHED.**
All HH-65A unit level and depot level maintenance activities.

6. **WHAT IS REQUIRED.**

a. SUPPLY INFORMATION AND REQUIREMENTS.

(1) Kit/Parts/Materials Required.
The following kit contains the parts required to comply with this TCTO and shall be requisitioned from Coast Guard Aircraft Repair and Supply Center, Elizabeth City, NC 27909-5001. Questions regarding the 14 degree frame repair kit should be referred to HH-65A Aircraft Section, telephone number (919) 335-6173, fax number (919) 335-6496.

QTY	NSN	PART NUMBER	NOMENCLATURE	SOURCE
01			Kit, 14 Degree Frame Repair	ARSC

The following parts are furnished in the 14 degree frame repair kit and do not need to be requisitioned separately.

QTY	NSN	PART NUMBER	NOMENCLATURE	SOURCE
01		H65-953140	TCTO	ACMS Contractor
01		950-162	Doubler	KD
12	5320-01-138-4239	CR3213-4-3	Rivet, Cherry Max	KD
02	5305-00-206-3701	NAS517-3-3	Screw, Machine	KD
02	5310-00-167-0753	AN960PD10L	Washer	KD

02	5310-00-807-1474	MS21042L3	Nut	KD
02	8010-00-515-1568	TT-L-20	Lacquer, Flat Dark Gray (GL)	KD

(2) Action Required on Items in Stock.
Not applicable

(3) Kits/Parts/Materials Required to Modify Items in Stock.
Not applicable.

(4) Disposition of Removed and Replaced Parts/Materials.
Not applicable.

(5) Drawings Required.
Not applicable.

(6) Size, Weight, and Cost of Kits/Parts/Materials.
Not applicable.

(7) Disposition of Kits/Parts/Materials.
Not applicable.

b. PERSONNEL INFORMATION AND REQUIREMENTS.

WORK PHASE	SKILLS	MAN-HOURS
Installation	AM	8.0
Inspection	QA	0.5
TOTAL		8.5

c. SPECIAL TOOLS, FIXTURES, AND SOFTWARE REQUIRED.
Not applicable.

7. **HOW WORK IS ACCOMPLISHED (Refer to Figure 1.).**

a. Locate aft side of the left 14 degree frame at the cabin door upper forward corner.

b. If a doubler has been previously installed, inspect area for crack propagation from under doubler. If crack propagation is found, contact ARSC Engineering for further assistance (919) 335-6210. If no cracks are found, TCTO can be signed off and no further action is required.

c. If no doubler is installed, perform a visual inspection of the 14 degree frame weld area for cracks.

d. Remove cover along forward side of 14 degree frame.

e. If a crack is found, proceed to step 7.f. for repair procedures. If no cracks are found, proceed to step 7.g. for doubler installation.

f. If a crack is found, remove paint and primer from localized area. If in doubt as to length of crack, perform NDI of the area. Stop drill approximately 1/16" past ends of crack utilizing a no. 40 drill bit. This will allow crack to extend into stop drilled hole assuring removal of undetected stress cracks.

g. Remove leather hand hold, two hex head bolts, two large diameter countersunk rivets, and LC nut (anchor nut). Retain reusable parts. Remove and discard small doubler from around anchor nut hole.

h. Place 14 degree frame doubler in place. Carefully inspect to ensure that the repair fits against airframe structure as tight as possible. Grinding of the base of the weld on doubler or airframe may be necessary for this repair doubler to fit correctly. There is some variance from airframe to airframe which may prevent a tight fit. If a reasonably tight fit cannot be obtained, contact ARSC Engineering for shimming instructions.

i. With doubler in place, mark location and drill holes for two hex head bolts (Item 2) and two countersunk machine screws (Item 1) utilizing a no. 10 drill bit. Countersink two holes (Item 1) with a 100 countersink.

j. Utilizing standard layout procedures, mark location and drill 12 holes along leg of doubler with a no. 30 drill bit.

k. Mark location and drill hole for LC nut (anchor nut) (Item 3) with a "J" drill bit. File notches required for LC nut installation.

WARNING

FLAT GRAY LACQUER IS FLAMMABLE. KEEP AWAY FROM ALL SOURCES OF IGNITION. USE IN WELL VENTILATED AREA.

l. Remove doubler, file radius on squared edges, deburr, treat with alodine, prime, and paint with at dark gray lacquer paint P/N TT-L-20.

WARNING

AVOID EYE AND SKIN CONTACT WITH SEALER MIL-S-81733. WASH HANDS THOROUGHLY AFTER HANDLING.

m. Apply a thin coat of sealer P/N MIL-S-81733 to inside of doubler and install on airframe.

n. Install two bolts (Item 2) retained from step 7.g., two machine screws P/N NAS517-3-3 (Item 3), nuts P/N MS21042L3, washers P/N AN960PD10L, and 12 remaining rivets P/N CR3213-4-3 (Item 4).

o. Install LC nut (anchor nut) (Item 3) and leather hand hold. AN960PD10L, and 12 remaining rivets P/N CR3213-4-3 (Item 4).

p. Install 14 degree frame forward cover.

**** Q.A. (1) REQUIRED AT THIS POINT ****

(Give concise description of what needs to be done. Include any illustrations as necessary and give step-by-step instructions for performing all inspections, replacements, retrofit changes, etc., required by the TCTO.)

8. **SUPPLEMENTAL INFORMATION.**

a. OPERATIONAL CHECKOUT REQUIREMENTS.
Not applicable.

b. WEIGHT AND BALANCE INFORMATION.
No effect.

(If this TCTO involves only adjustment or procedure, use the statement "no effect." If the weight change is less than five pounds, and the center of gravity and the Chart A basic weight checklist are not affected by relocation of items, state "negligible"; otherwise, state "as follows" and use the following format.)

ITEMS ADDED	WEIGHT	ARM	MOMENT/1000
XXXX	+/-XXX	XXX	+/-X.X

c. TECHNICAL MANUALS AFFECTED.

Not applicable.

(If this TCTO affects a published T.O., include the T.O. number, date of issue, and tracking number of CG-22 or Technical Publication Deficiency Report (TPDR) which has been submitted with the TCTO. If this TCTO affects a published ACMS MPC, include the MPC number, revision date, and tracking number of the CG-22 or TPDR which has been submitted with this TCTO. If maintenance or operational procedures will be changed, or added, include Technical Order Page Supplement (TOPS).)

d. TRAINING EQUIPMENT AFFECTED.

Not applicable.

(If this TCTO affects the aircraft simulator, hot mock-up, or other training aids, include a statement describing the change in configuration or performance of the training equipment.)

9. **RECORDS.**

a. ACTION REQUIRED ON MAINTENANCE RECORDS.
The applicable (airframe MGB, engine, stator vane actuator, dampener, etc.) SCHR will be automatically updated upon completion of MPC XXXXXX.

b. ACTION REQUIRED ON SUPPLY RECORDS.
Not applicable.
(Changes to IPB, stock cards, etc.)

c. MODIFICATION IDENTIFICATION MARKINGS.
Not applicable.
(Specific markings if required. For example "TCTO number stenciled next to nameplate" or "mark out number 6 on the modification plate.")

WARNING

THIS IS A SAMPLE OF A WARNING. ONLY THE HEADING IS IN BOLD PRINT AND THERE IS NO LINE BETWEEN THE HEADING AND THE FIRST LINE OF TEXT. IT IS TYPED IN ALL CAPITAL LETTERS AND TEXT IS FULLY JUSTIFIED. THE HEADING OF A WARNING IS IN 12 PITCH PROPORTIONAL TYPE AND THE BODY IS 10 PITCH PROPORTIONAL.

CAUTION

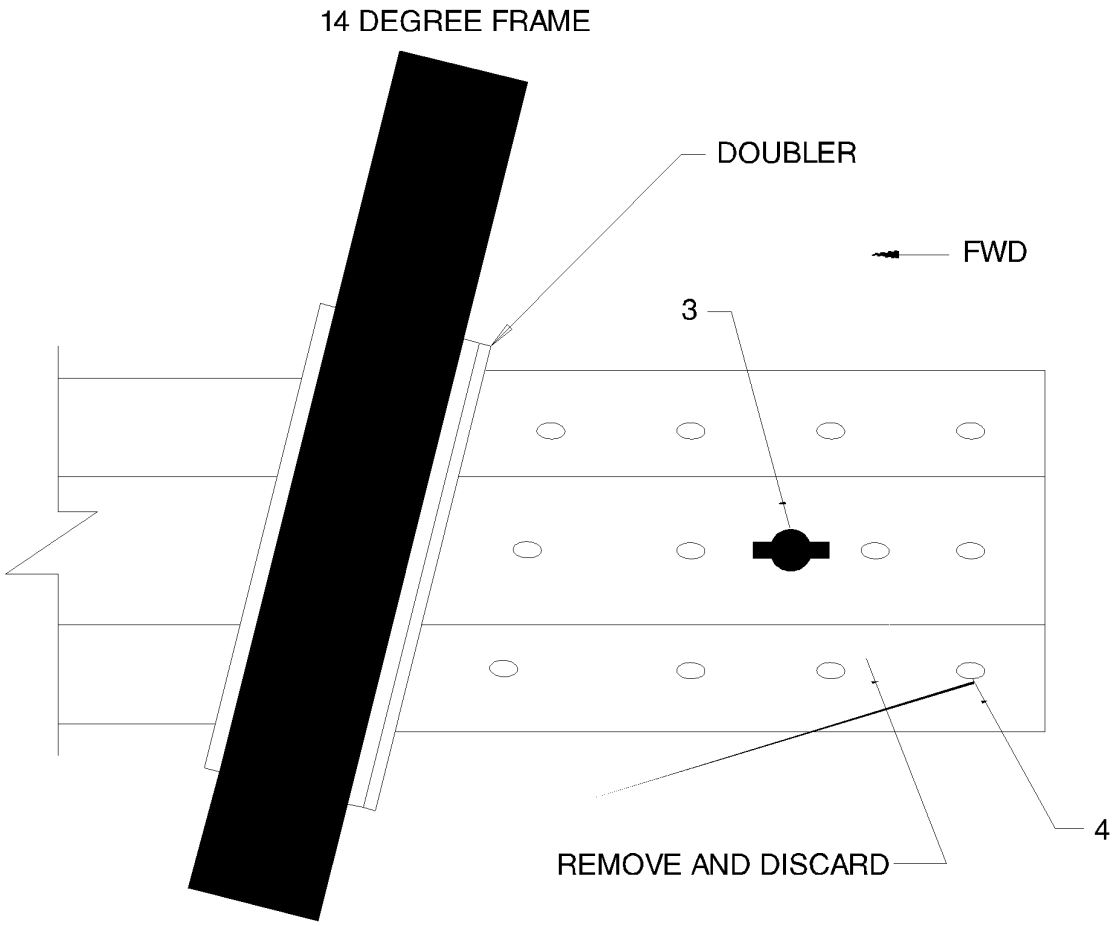
USE THE SAME FORMAT AS A WARNING.

NOTE: This is a sample of a note. The text is typed fully justified. The word note appears at the beginning of the first line of text and not as a heading. The word note is bold and capitalized, the entire note is 10 pitch proportional type.

NOTE: The first page of the TCTO acts as a cover sheet. Start typing the text of the TCTO on page 2. The TCTO number (TCTO: H65-XXXXXX) will be located in the upper right hand corner of the header and the page number (Page 2 of 4) will be located in the bottom right hand corner of the footer starting on page 2.

NOTE: Enclosures should be restricted to excerpts from other publications. Identify enclosures with the TCTO number to which attached, such as ENCLOSURE (43) to TCTO H65-XXXXXX. Figures should be numbered (1), (2), etc., and appear in the same sequence as referred to in the body of the TCTO. Photographs and drawings should appear as FIGURES and be included in the page numbering sequence. Drawings should include a reference to the drawing number.

ENCL (3) TO COMDTINST M13020.1E



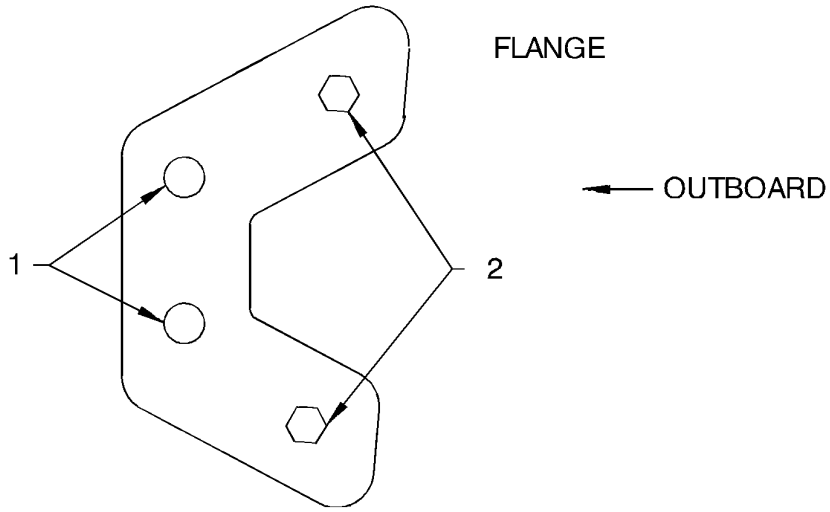


Figure 1.

Figure 1.

A. Draft TCTOs may be submitted in hard copy or electronic media from field units, prime units, or Government contractors. Due to the variety of media types and file formats available, please contact ARSC Technical Publications Section (919) 335-6829 prior to sending any form of electronic media.

B. Use short, concise sentences, ensuring they are technically accurate. form of electronic media.

C. The use of CG common acronyms is acceptable. It is not necessary to write out the long version of IAW, QA, TCTO, UR, CGAS, AFTO, etc.

D. The use of diagrams and tables is encouraged. However, ensure they are referenced in the text of the TCTO. Diagrams will be re-drawn by ARSC staff, in most cases.

E. The following guidelines apply for photographs:

1. Submit unprocessed film or negatives.

2. If using 120 black and white format, use KODAK Verichrome 125.

3. If using 35mm or 120 color formats, use KODAK Gold 100.

4. If 35mm black and white format, use KODAK T-MAX-100 or T-MAX-400.

5. ARSC photo lab has the ability to process these films and will be able to produce better quality TCTO photographs if these guidelines are followed.

6. Illustrations and comments which identify areas and or parts on photographs can be made if you send a photograph, but will only be used to assist ARSC's illustrators in preparing a final copy.

7. Use adequate lighting with a contrasting background when taking photographs.

8. Never take a photograph of an area larger than necessary to convey your message.

F. When providing dimensions in the text of a TCTO or on diagrams, use the following guidelines:

1. All dimensions shall be listed in SAE format (inches and feet), with metric dimensions added in parentheses if required.

2. Use two letter abbreviations for dimensions, such as in., ft., mm., cm., etc.

3. For hand layout, cutting, and general metal work, mark all dimensions to the nearest 0.01 inch and/or 0.1 millimeter.

4. For machining operations, mark all dimensions to the nearest 0.001 inch and/or 0.01 millimeter.

5. If a given dimension is less than 1, place a 0. to the left of the decimal point. For example, write a 0.15 instead of .15.

6. Ensure the same accuracy is used for a given dimension between text and diagram. For example, do not list a dimension of 0.12 in. in the text and indicate the same dimension on the diagram as 0.124 in.

7. Never use fractions. Drill bits should be referred to as No._____ or size_____.

G. Always write in the present tense.

H. If Q.A. inspections are required, always show a line item estimate for Q.A. man-hour and skill requirements in the Personnel Information paragraph (paragraph 6.b.) of your TCTO.

I. TCTO number and work order number for all TCTOs will be obtained from ARSC Technical Publications Section, (919) 335-6622 and shall be included in the header of the TCTO. (See page 2 of this enclosure.)

SAMPLE MESSAGE TCTO

PP

UNCLASSIFIED

FM COGARD ARSC ELIZABETH CITY NC//ENG//

TO AIG XXXXXXXXXXX
AIG XXXXXXXXXXX
INFO COMDT COGARD WASHINGTON DC//G-SEA//
COGARD AR SC ELIZABETH CITY NC//ACMS//
COGARD ARSC ELIZABETH CITY NC
XXXXXX (INCLUDE USAF, USN, MANUFACTURER AS APPROPRIATE TO ACFT TYPE)

BT
UNCLAS //N13052//

SUBJ: CG MESSAGE TCTO SUBJECT

A. REFERENCES AS REQUIRED.

1. APPLICATION. STATE THE AIRCRAFT TYPE AND/OR EQUIPMENT AFFECTED BY THE TCTO.

2. PURPOSE. EXPLAIN CONCISELY THE INTENT OF THE TCTO, INCLUDING REASONS FOR ANY INSPECTION OR REPLACEMENT REQUIRED.

3. TCTO COORDINATOR. PROVIDE THE NAME AND PHONE NUMBER OF PERSON(S) COGNIZANT OF THE TCTO REQUIREMENTS.

4. WHEN TO BE ACCOMPLISHED. ESTABLISH A TIME LIMIT DEPENDENT ON URGENCY. (FOR EXAMPLE - "WITHIN 15 CALENDAR DAYS" OR "WITHIN 15 FLIGHT HRS").

5. BY WHOM TO BE ACCOMPLISHED. STATE AT WHAT LEVEL THE WORK WILL BE PERFORMED (ARSC, UNIT, CFT, ETC.).

6. WHAT IS REQUIRED.

A. SUPPLY INFORMATION AND REQUIREMENTS. LIST ALL PARTS AND OTHER SUPPLIES NEEDED TO COMPLETE THE TCTO. INCLUDE QUANTITY, NSN, MANUFACTURER'S PART NUMBER, AND SOURCE OF SUPPLY FOR EACH PART . SPELL-OUT ANY SPECIAL INSTRUCTIONS FOR REQUISITION OF PARTS. (READ IN 5 COLUMNS.)

QTY	NSN	PART NUMBER	NOMENCLATURE	SOURCE

B. PERSONNEL INFORMATION AND REQUIREMENTS. (READ IN 3 COLUMNS.) (COMPLETE AS APPROPRIATE FOR THE TASK INVOLVED.)

WORK PHASE	SKILL	LABOR HRS.
INSPECTION	AE	0.5
REMOVAL/INSTALLATION/QA	AE	3.0
OPERATIONAL CHECKOUT	PILOT/AE	1.0

7. HOW WORK IS ACCOMPLISHED. GIVE STEP-BY-STEP PROCEDURE INCLUDING COMPLETE LIST OF SPECIAL TOOLS REQUIRED AND INSTRUCTIONS ON DISPOSITION OF REMOVED PARTS AND MATERIALS.

8. SUPPLEMENTAL INFORMATION.

A. OPERATIONAL CHECKOUT REQUIREMENTS. DESCRIBE CHECKOUT PROCEDURES WHEN THEY ARE REQUIRED.

B. WEIGHT AND BALANCE INFORMATION. PROVIDE WEIGHT AND BALANCE CHANGES WHEN THE WEIGHT AND BALANCE ARE AFFECTED.

C. TECHNICAL MANUALS AFFECTED. LIST ALL TECHNICAL MANUALS THAT WILL BE AFFECTED BY THE TCTO.

D. TRAINING EQUIPMENT AFFECTED. INDICATE ANY TRAINING EQUIPMENT THAT WILL REQUIRE MODIFICATION.

9. RECORDS. SPECIFY ALL RECORDS THAT ARE TO BE UPDATED.

A. ACTION REQUIRED ON MAINTENANCE RECORDS. INCLUDE THE FOLLOWING STATEMENT. "THE AIRFRAME SIGNIFICANT COMPONENT HISTORY RECORD (SCHR) WILL BE ELECTRONICALLY UPDATED UPON COMPLETION OF THE TCTO."

B. ACTION REQUIRED ON SUPPLY RECORDS. STATE THE SUPPLY RECORD AFFECTED AND WHAT ACTION IS TO BE TAKEN ON THAT RECORD.

BT
DRAFTED BY: J. M. WIZARD, CWO2, USCG, ARSC, X6XXX
RELEASED BY: E. J. OVERSEER, CDR, USCG, ARSC, X6XXX

DOD TECHNICAL ORDER SYSTEM
THE AIR FORCE T.O. SYSTEM

A. TYPES OF TECHNICAL ORDERS.

NOTE

The Air Force Technical Order system is the only official medium for disseminating technical information, instructions, and safety procedures for the operation, maintenance, inspection, and modification of Air Force equipment and materiels. Exception: Where Aviation Computerized Maintenance System (ACMS) or a Coast Guard publication is available.

1. Technical Manuals. These manuals cover installation, operation, maintenance, and handling of Air Force equipment and materiel. Complex systems or equipment requiring a specific type of manual, such as a maintenance manual or a parts breakdown, may be published in sections. Each section constitutes a separate publication with a separate T.O. number. For less complex items, specific types of instructions are published in a single manual. The "Aircraft Manuals" series is the class of technical manuals most often used by maintenance personnel.

2. Reference Manuals.

   a. 0-1-01 - List of Applicable Publications for the Numerical Index Requirements Table

   b. 0-4-6-2 - Equipment Numbers to Technical Order Numbers

   c. 00-5-1 - AF Technical Order System

   d. 00-5-2 - Technical Order Distribution System

   e. 00-5-18 - USAF Technical Order Numbering System

B. METHODS FOR UPDATING TECHNICAL ORDERS.

1. Changes.

   a. Changes are issued when only parts of the existing T.O.s are affected. The changed pages replace the corresponding numbered pages, and all replaced pages must be removed from the T.O. and discarded. Changes containing foldout pages are assembled with the foldout pages at the back of the change.

   b. Changed pages are identified by referring to the List of Effective Pages (back side of title page), which indicates the change number and/or change dates. The change number is printed in the lower corner of the changed page with the page number. Changes in the text are indicated by a heavy black line in the outer margin opposite the changed part of the text.

   c. A new title page will be issued with each change. The new title page will bear the basic T.O. date as well as the change number and the date of the change.

2. Technical Order Page Supplement (TOPS).

   a. A TOPS (green page) is different from a standard change in that it supplements rather than replaces an individual page in a technical order. A TOPS page is filed in the T.O. facing the affected T.O. page.

   b. The T.O. number of a TOPS is the same as the basic technical order. Each TOPS is identified by a TOPS number and date printed under the basic T.O. date on the TOPS title page. Technical order page supplements for each T.O. will be numbered sequentially starting with the number TP-1.

   c. A revision will supersede all active TOPS. The TOPS active at the time the revision is issued will be listed in the supersedure notice. If data in a superseded TOPS is not

included in the revision but is still valid, a new TOPS will be issued concurrently with this revision to include this data. If a standard change supersedes all active TOPS, previous TOPS will be listed in the supersedure notice.

3. Revisions.

   a. A revision is a complete new edition of an existing T.O. and has a new basic date. It includes existing changes and replaces any supplements listed in the replacement note on the title page. Normally, a T.O. is revised when the pages affected by existing changes, in addition to pages requiring change, total 50% or more of the technical order.

   b. Black vertical borderline symbols indicate current changes in the text of a revision which were not previously published as T.O. changes or supplements.

4. Supplements.

   a. Supplements are issued to augment or change data in the basic T.O.s that are not adaptable to the inclusion of individual change pages.

   b. Supplements may be cumulative or noncumulative. Cumulative supplements include all data in supplements previously issued and supersede the preceding supplements. Noncumulative supplements do not include information in supplements previously issued and do not supersede a preceding supplement. When a basic T.O. is replaced by a revision, the revision normally includes all the essential information in outstanding supplements. Flight manuals are supplemented by Safety Supplements or Operational Supplements.

5. Appendixes. Appendixes are used to include materiel in a T.O. that is not a part of the normal sequence outlined in the table of contents. These include tables, charts, etc.

6. Rescissions. T.O.s are rescinded when the information contained therein is no longer required or is incorporated in other publications. A rescission date is also indicated on TCTOs.

C. TECHNICAL ORDER CATEGORIES. (Refer to T.O. 00-5-18 for further breakdown.)

T.O. CATEGORY	TITLE
0	Numerical Index and Requirements Tables, Numerical Index, Alphabetical Indexes, and Cross Reference Table Technical Orders
00	General Technical Orders
1	Aircraft Technical Orders
2	Airborne Engine Technical Orders
3	Aircraft Propellers and Associated Equipment Technical Orders
4	Aircraft Landing Gear Components and Associated Equipment Technical Orders
5	Airborne Instrument Technical Orders
6	Aircraft Missile Fuel Systems and Equipment Technical Orders
7	Airborne Engine Lubricating Systems and Associated Equipment Technical Orders
8	Airborne Electrical Systems Technical Orders

T.O. CATEGORY	TITLE
9	Airborne Hydraulic, Pneumatics and Vacuum Systems Technical Orders
10	Photographic Equipment, Supplies, and Sensitized Materiels Technical Orders
11	Armament Technical Orders
12	Airborne Electronic Equipment Technical Orders
13	Aircraft Furnishings, Cargo Loading and Aerial Delivery, and Firefighting Equipment Technical Orders
14	Deceleration Devices, Personal and Survival Equipment Technical Orders
15	Aircraft and Missile Temperature Control, Pressurizing, Air Conditioning, Heating, Ice Eliminating, and Oxygen Equipment Technical Orders
16	Airborne Mechanical Equipment Technical Orders
21	Guided Missile Technical Orders
22	Aerospace Technical Orders
32	Standard and Special Tools Technical Orders
33	General Purpose Test and Associated Equipment Technical Orders
35	Ground Handling, Support and Base Operating Equipment Technical Orders
36	Vehicles, Construction and Materiels Handling Equipment, and Equipment and Components Technical Orders
37	Fuel, Oil, Propellant Handling and Associated Equipment Technical Orders
38	Non-Aeronautical Engines and Components Technical Orders
39	Watercraft and Associated Equipment Technical Orders
40	Commercial Air Conditioning, Heating, Plumbing, Refrigerating, Ventilating, and Water Treating Equipment Technical Orders
41	Subsistence and Food Service Equipment Technical Orders
42	Chemical, Oxygen, Metal, Textile, Fuels, Cordage, Lumber, and Rubber Materiels (Dopes, Cleaning Compounds, Glues, Gases, Lubricants, Paints, Plastics, and so forth) Technical Orders

T.O. CATEGORY	TITLE
43	Training Devices and Associated Equipment Technical Orders
44	Common Hardware Equipment Technical Orders
45	Railroad and Associated Equipment Technical Orders
46	Office, Duplicating, Printing and Binding Equipment Technical Orders
47	Agricultural Equipment Technical Orders
48	Laundry and Dry Cleaning Equipment Technical Orders
49	Optical, Instruments, Timekeeping, and Navigation Equipment Technical Orders
50	Special Service Equipment Technical Orders
51	General Purpose Automatic Test Systems (GPATS) and Versatile Automatic Test Systems (VATES) Technical Orders
60	Explosive Ordnance Disposal Technical Orders

D. TYPES OF TECHNICAL ORDERS.

T.O. CATEGORY	TITLE
01	List of Applicable Publications (LOAP) Unit
06 thru 09	Work Unit Code Manual
1	Flight Manual
2	Maintenance Instructions
3	Structural Repair Instructions
4	Parts Catalog
5	Basic Weight Checklist and Landing Data
6	Inspection Requirements
7	Winterization Instructions
8	Checkout Manuals
9	Cargo Loading
10	Power Package Build-up Instructions
11	Power Package Build-up Instructions
12	Maintenance Materiel Management Manual
13	Weapons Loading Manual
14	Atomic Loading and In- flight
15	Assembly, Test, and Storage Procedures
16	Atomic Loading and In-Flight (See 0-1-11N)
17	Storage of Aircraft
18	Field Maintenance of Airborne Materiel
19	Conversion Instructions
20	Reserved

T.O. CATEGORY	TITLE
21	Aircraft Inventory Record Master Guide
22	Reserved
23	Corrosion Control
24	Reserved
25	Air Crew Weapon Delivery Manuals (See TO 0-1-11N)
26	Air Crew Weapon Delivery Manuals (See TO 0-1-11N)
27	Air Crew Weapon Delivery Manuals (See TO 0-1-11N)
28	Air Crew Weapon Delivery Manuals (See TO 0-1-11N)
29	Air Crew Weapon Delivery Manuals (See TO 0-1-11N)
30	Air Crew Weapon Delivery Manuals (Air-to-Ground) (See TO 0-1-11N)
31	Air Crew Weapon Delivery Manuals (Automatic Toss Bomb Computing System) (See TO 0-1-11N)
32	In-Flight Maintenance Manual
33	Conventional Munitions Loading
33-1	Conventional Munitions Loading-Tactical Missions
33-2	Conventional Munitions Loading-Strategic Missions
33-3	Conventional Munitions Loading-Defense Missions
33-4	Conventional Munitions Loading-Transport Missions
34	Conventional Munitions Delivery
34-1	Conventional Munitions Delivery-Tactical Missions
34-2	Conventional Munitions Delivery-Strategic Missions
34-3	Conventional Munitions Delivery-Defense Missions
34-4	Conventional Munitions Delivery-Transport Missions
35	Non-Munitions Accessories
36	Non-Destructive Inspection Manuals
37	Calibration and Measurement
38-100	Reserved

THE NAVY T.O. SYSTEM

A. TYPES OF TECHNICAL ORDERS.

NOTE

The Navy Technical Order system is the only official medium for disseminating technical information, instructions, and safety procedures for the operation, maintenance, inspection, and modification of Navy equipment and materiels. Exception: Where ACMS or a Coast Guard publication is available.

1. Technical Manuals/Work Packages/Directives. These manuals cover installation, operation, maintenance, and handling of Navy equipment and materiel. Complex systems or equipment requiring a specific type of manual, such as a maintenance manual or a parts breakdown, may be published in sections called work packages. For less complex items, specific types of instructions are published in a single manual. The "Aircraft Manuals" series is the class of technical manuals most often used by maintenance personnel.

2. Reference Manuals.

a. 00-25-100 - Naval Air Systems Command Technical Manual Program

b. 00-500A - Naval Aeronautic Part Number Technical Manual Index

c. NAVSUP 2002D - Navy Stock List of Publications

d. N0000-00-IDX-000/TIMINS - Navy Standard Technical Manual Identification Numbering System

B. METHODS FOR UPDATING TECHNICAL MANUALS.

1. Changes.

a. Changes are issued when only parts of the existing manual are affected. The changed pages replace the corresponding numbered pages, and all replaced pages must be removed from the manual and discarded. Changes containing foldout pages are assembled with the foldout pages at the back of the change.

b. Changed pages are identified by referring to the List of Effective Pages (back side of title page), which indicates the change number and/or change dates. The change number is printed in the lower corner of the changed page with the page number. Changes in the text are indicated by a heavy black line in the outer margin opposite the changed part of the text.

c. A new title page will be issued with each change. The new title page will bear the basic manual date as well as the change number and the date of the change.

2. RAC (Rapid Action Change)

a. Distributed by expedited means to all units under distribution for the publication. RACs normally involve possible safety of flight or faulty equipment items.

3. IRAC (Interim Rapid Action Change)

a. Normally distributed in a message format. Will require immediate action.

C. MANUAL CATEGORIES.

NOTE

The Navy uses the standard NAVAIR numbering system and TIMINS numbering system. Due to the complexity of the TIMINS numbering system, refer to the N0000-00-IDX-000/TIMINS manual for the breakdown of the TIMINS number.

1. 00 Series - General.

NAVAIR NUMBER		TIMINS NUMBER
00-25	Management and Procedures Manuals	
00-75	Air Safety	
00-80	DCNO (AIR) Aviation Training Literature	
00-85	Protective Packaging and Preservation (See 15 Series also)	
00-100	Evaluation Program of Aviation Shore Facilities	
00-110	Standard Aircraft Characteristics	
00-130	Joint Munitions Manuals	

Naval Aeronautic Publications Index

NAVAIR NUMBER		TIMINS NUMBER
00-500A	Equipment Applicability List	
00-500AV	Avionics Change Cross Reference	
00-500B	Aircraft Application List	
00-500C	Directives Application List	
00-500M	Microfilm Cross Reference Index	
00-500P	Publication Distribution Index	
00-500SE	Support Equipment Cross Reference	
01-700	Airborne Weapons/Stores, Conventional/ Nuclear, Check Lists/Stores, Reliability Cards/Manuals	
NAVSUP PUB		
2002	Navy Stock List of Publications and Forms	

2. 01 Series - Aircraft, Missiles, Targets, and Drones.

		TIMINS NUMBER
01-AGM84	McDonnell-Douglas - AGM-84A Harpoon Missile	
01-AIM54	Hughes Aircraft - AIM-54A Phoenix Missile	
01-ARGM84	McDonnell-Douglas - RGM-84A Harpoon Missile	
01-AV8	Hawker-Siddeley - AV-8A Harrier Hawker-Siddeley - AV-8B Harrier	 A1-AV8
01-CH47	Boeing-Vertol - CH-47C Chinook	
01-C9B	McDonnell-Douglas - C-9B Skytrain II	
01-E2	Grumman - E-2 Hawkeye	
01-F14	Grumman - F-14 Tomcat	
01-F18	McDonnell-Douglas - F-18 Hornet	A1-F18
01-H53	Sikorsky - H-53 Sea Stallion	A1-H53
01-H60	Sikorsky - H-60 Sea Hawk	A1-H60
01-MQM	Northrop - MQM-74C Chukar II Missile Target	
01-S3	Lockheed - S-3 Viking	
01-T34	Beech - T-34 Mentor	
01-VH3	Sikorsky - VH-3D Sea King	
01-1A	General Engineering Series	
01-5	General Dynamics	
01-15	Naval Avionics Center, Indianapolis	
01-30	Northrop	
01-40	McDonnell-Douglas (Douglas)	
01-45	Vought Aerospace Corporation	
01-50	Raytheon	
01-60	Rockwell International Corporation	
01-75	Lockheed	
01-80	NWC, China Lake	

01-85	Grumman	
01-90	Beech	
01-100	Ryan	
01-110	Bell	
01-115	Fairchild	
01-140	Piper	
01-230	Sikorsky	
01-245	McDonnell-Douglas (McDonnell)	
01-250	Boeing-Vertol	
01-260	Kaman	
01-265	Raytheon	

3. 01-600 Series - NATO Aircraft Cross Servicing Schedules.

01-600	American-British-Canadian-French	
01-610	Canada	
01-620	France	
01-660	United Kingdom	

4. 01-700 Series - Special Check Lists.

5. 02 Series - Power Plants.

02-1	Aircraft Engines - General	A1-700
02A	Reciprocating Engines	A1-710
02A-10	Pratt and Whitney	
02A-35	Wright	
02A-40	Teledyne	
02 B	Jet Propulsion Engines	A1-720
02B-5	Detroit Diesel, Allison Division	
02B-10	Pratt and Whitney	
02B-15	Lycoming	
02B-20	Pratt and Whitney Aircraft of Canada, Limited	
02B-25A	Garrett Turbine Engine Company	
02B-30	Williams Research	
02B-35	Wright	
02B-40	Teledyne	
02B-70	Rolls Royce	
02B-105	General Electric	A1-T700 A1-F404
02B-110	Westinghouse	

6. 03 Series - Accessories.

03-1	General	A1-400
03-5	Electrical Equipment	A1-210
03-10	Fuel System	A1-470
03-15	Oil Systems	A1-750
03-20	Propellers and Accessories Equipment	A1-800
03-25	Wheels, Brakes, Struts, and Related Equipment	A1-420
03-30	Air and Hydraulic Equipment	A1-440
03-35	Ice Eliminating Equipment	A1-450
03-40	Control Units	A1-650
03-45	Fire Extinguishers and Related Equipment	A1-610
03-50	Oxygen Equipment	A1-460
03-55	Carbon Dioxide Fire Extinguisher Inflation	A1-600
03-60	Purging Equipment	A1-620
03-65	Pickup Equipment	A1-400
03-70	Heaters and Related Equipment	A1-640
03-75	Temperature Control Systems and Related Equipment	A1-650
03-80	Cabin Pressurizing Equipment	A1-460
03-85	Afterburners and Related Equipment	A1-790
03-90	Loading Equipment	A1-480
03-95	Helicopter Rotor and Related Equipment	A1-810
03-100	In-Flight Refueling Equipment	A1-470
03-105	Turbine Starters	A1-725
03-110	Jet Engine Fuel Systems and Related Equipment	A1-760
03-600	Accessories Series Maintenance Requirements Cards	A1-640XX-MRC

7. 04 Series - Aircraft Hardware and Rubber Materiel.

8. 05 Series - Instruments.

05-1	General	AN-000
05-5	Tachometers	AN-524
05-10	Airspeed Indicators	AN-120
05-15	Aircraft Compasses	AN-310
05-20	Flight Instruments	AN-100
05-25	Drift Meters	AN-800
05-30	Altimeters	AN-110
05-35	Navigation Equipment	AN-400
05-40	Thermometers	AN-512
05-45	Automatic Pilots, Stabilization Systems, and Related Equipment	AN-300
05-50	Pitot-Static and Power Venturi Tubes	AN-860
05-55	Self-Synchronous Instruments	AN-370
05-60	Electric Circuit Instruments	AN-700

05-65	Fuel Flow Meters and Content Gages	AN-610
05-70	Pressure Systems, Gages, Indicators, and Transmitters	AN-560
05-75	Engine Gage Units	AN-511
05-80	Suction Gages	AN-900
05-85	Ignition and Engine Analyzers	AG-501
05-90	Signal Assemblies	AN-500
05-95	Test Equipment	AG-500
05-105	Test Equipment	AG-600

9. 06 Series - Fuels, Lubricants and Gases.

10. 07 Series - Dopes and Paints (See 15 Series also). AG-365

11. 08 Series - Electronics, Airfield Lighting, and Related Accessories (See 16 and 19 Series also).

08-5	Radio, Radar	
08-10	Transmitter, Receiver	
08-20	Airfield Lighting Equipment	
08-25	Instruments	
08-35	Joint Nomenclature Radio Components	
08-45	Commercial British and Navy Radio Equipment	

12. 09 Series - Instructional Equipment and Training Aids (See 01 and 28 Series also).

13. 10 Series - Photography.

10-1	General	AP-000
10-10	Camera Equipment	AP-100
10-20	Projection Equipment	AP-300
10-25	Photo Lab Equipment	AP-200
10-30	Interpretation Equipment	AP-410
10-35	Photographic Keys	AP-400
10-50	Photo Test Equipment	AP-270

14. 11 Series - Aviation Armament/Ordnance and Accessories.

11-1	General AW-000	
11-5	Bombs, Depth Charges, and Accessories	AW-382
11-10	Gun Mounts and Gun Accessories	AW-380
11-15	Pyrotechnics and Accessories	AW-052
11-30	Dispensers AW-390	
11-45	Gun Turrets, Components, and Accessories	AW-300
11-55	Tow Targets and Accessories	AW-141
11-60	Automatic Flight Control Equipment	AW-235
11-70	Armament Control Systems, Components, and Accessories	AW-240

11-75	Missiles and Related Accessories	AW-800
11-80	Mines, Mine Sweeping, and Accessories	AW-550
11-85	Rockets and Accessories	AW-040
11-95	Guns, Gunpods, and Accessories	AW-380
11-100	Cartridge Actuating Devices	
11-110	Aircraft Boresights	
11-120	Ship Weapons Installation	
11-140	Pre-Loaded Weapons Uninstalled Suspension Equipment	
11-265	Production Line Maintenance	AW-240XX-MMI
11-600	Aviation Armament Series Maintenance Requirements Cards	AW-800XX-MRC
11N	Armament, Nuclear	AW-080

15. 13 Series - Parachute and Personal Survival Equipment. AS-000

16. 15 Series - Standard Preservation and Packaging Instructions (See 00-85 Series also).

15-01	Aircraft and Airframes	A1-F18XX-PPI
15-02	Aircraft Engines	A1-F40XX-PPI
15-03	Accessories	A1-650XX-PPI
15-05	Instruments	A1-524XX-PPI
15-16	Electronics	AE-450XX-PPI

17. 16 Series - Electronics (See 08 Series also).

16-1	General	AE-000
16-5	Radio, Radar	
16-30	Joint Nomenclature (Electronic Test Equipment)	
16-35	Joint Nomenclature (Electronic Test Components)	
16-40	Signal Corps - Nomenclature Radio Equipment	
16-45	Commercial British and Navy Electronic Test Equipment	
16-50	Automatic and Semi-Automatic Electronic Checkout Equipment	AE-190 AE-398
16-75	Test Tapes	
16-80	Test Set Cards/Overlays and Punched Cards	AE-190XX-TSC
16-300	Certification Procedures (Security Equipment)	AE-180XX-ECI
16-600	Electronic Series Maintenance Requirements Cards	AE-170XX-MRC

18. 17 Series - Machinery, Tools, and Test Equipment.

17-1	Shop and Warehouse Machinery	AG-200
17-5	Shop and Warehouse Machinery, Powered Tools, and Equipment	
17-10	Shop and Warehouse Machinery, Non-powered Tools and Equipment	
17-15	Lab and Shop Test and Inspection Equipment (See 05-95 Series also)	AG-600
17-20	Instrument Calibration Procedures	
17-25	Measurement System Operation Procedures	
17-35	Miscellaneous Calibration Procedures and Metrology Requirements Lists	
17-40	MIARS Equipment	
17-75	Testers and Test Card Sets	
17-600	Support Equipment Maintenance Requirement Cards	AG-200XX-MRC

19. 19 Series - Ground Servicing and Mobile Equipment (See 08-20 Series also).

19-1	General	AG-000
19-5	Oxygen Equipment	AG-100
19-10	Airfield Lighting Equipment	AG-260
19-15	Platform and Scaffolds	AG-220
19-20	Portable Shop Equipment	AG-200
19-25	Fire Truck, Miscellaneous Trucks, and Trailers	AG-310
19-30	Field Starters (Mobile)	AG-320
19-35	Air Compressor (Other than Power Plant)	GS-210
19-40	Tractors and Aircraft Towing	AG-305
19-45	Mobile Electric Power Plants	AG-320
19-50	Generators for other than Power Plants	AG-110
19-60	Portable Heaters and Coolers	AG-160
19-70	Airplane Hydraulic Jacks	AG-250
19-75	Generator Skid or Trailer Mounted (Gas/Nitrogen)	AG-750
19-80	Motorized Materiel Handling Equipment	AG-300
19-95	Transporting and Loading Equipment Configuration	AG-800
19-100	Handling Equipment	AG-810
19-105	Gas Turbine Compressors and/or Power Units	AG-850
19-110A	Blower-Gasoline Driven	AG-900
19-600	Support Equipment Maintenance Requirements Cards	AG-850XX-MRC

20. 28 Series - Instructional Equipment and Training Aids (See 09 Series also). A8-300

21. 50 Series - Meteorology DCNO (Air) (See 16 Series also). AM-000

50-1	Text and Reference Material, Climatological Information, Directive Material, General Information, Techniques, and Procedures	AM-005
50-30	Meteorological and Aerological Weather Equipment	AM-400

22. 51 Series - Ship Installations.

51-5	Arresting and Barrier Gear	AD-100
51-15	Catapults	
51-25	Catapult Support Gear	AD-200
51-35	Homing Devices and Beacons	AE-175
51-40	Landing/Lighting Systems	AD-600
51-50	Visual Landing Aids	AD-400
51-60	Pilot-LSO Landing Aids, Auxiliary Landing Fields and Maps	
51-70	Jet Blast Deflectors	

SAMPLE LETTER FOR AIRCRAFT RELEASE AUTHORITY

From: Engineering Officer

To:

Subj: Aircraft Maintenance Release Authority

Ref: a. Air Operations Manual, COMDTINST M3710.1 (series)

b. Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1 (series)

1. In accordance with reference (b) you are authorized to release aircraft assigned to this Aviation Unit for flight after corrective maintenance has been performed. As such, you are directed to familiarize yourself with the duties described in reference (a) and reference (b).

2. You are authorized to release aircraft for flight. Additionally, you may authorize Carry Forwards (CFs), Parts Pending (PP), and aircraft cannibalization. The authority to release grounded aircraft for ight is an extremely serious responsibility. It requires thorough and complete understanding of the maintenance/mechanical discrepancy, the corrective action taken, and the quality of that action; i.e., was it the correct action properly completed?; who did the maintenance?; who QA'd it?; and under what circumstances? Your shipmates will be relying on your professionalism and sound judgment. Never lose sight of the seriousness of the special trust which I have placed upon you.

3. This authority is not to be delegated. You may pass your authorization by any appropriate communications channel if you can satisfy yourself that the above provisions have been complied with.

ENCL (6) TO COMDTINST M13020.1E

AIRCRAFT INVENTORY RECORD

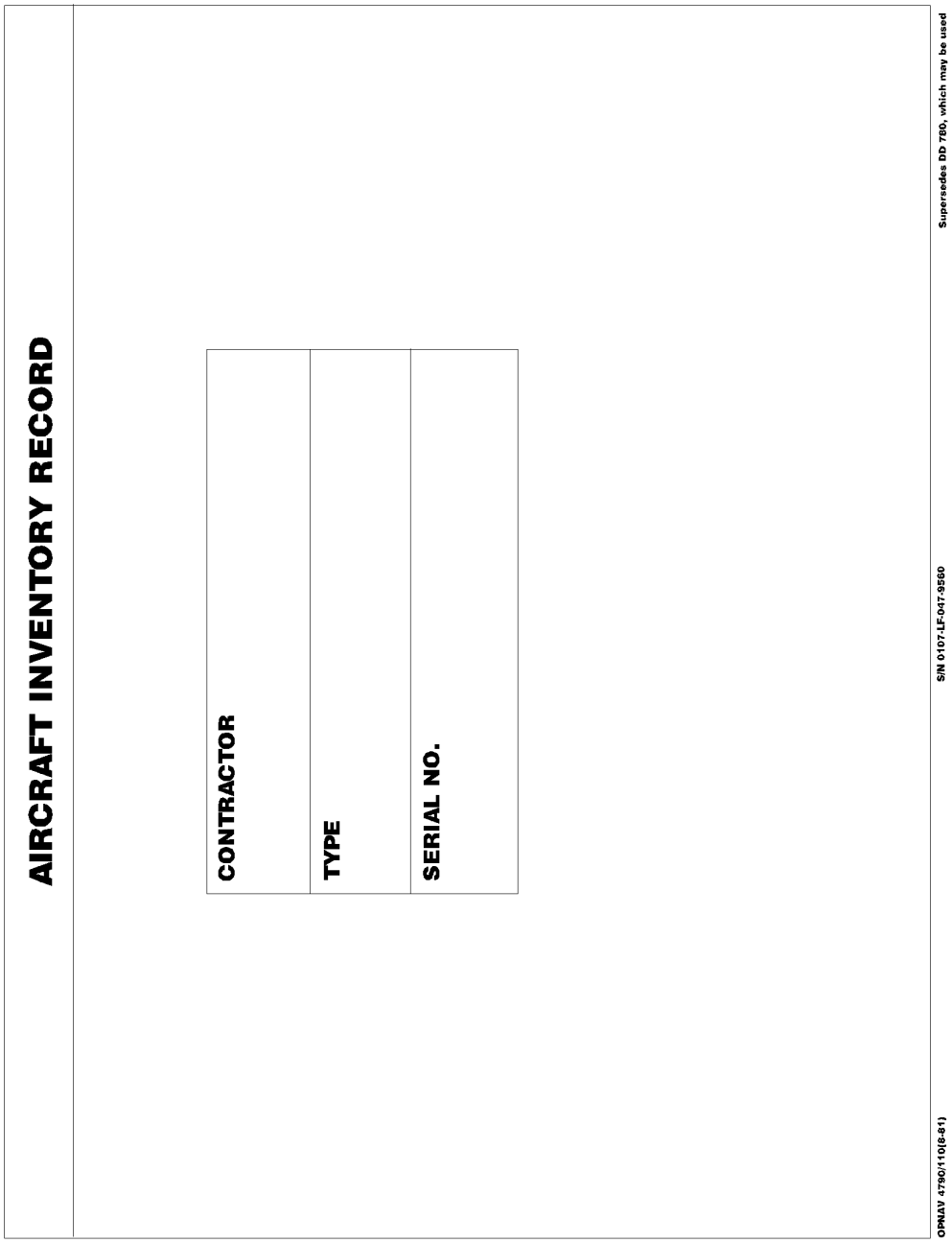
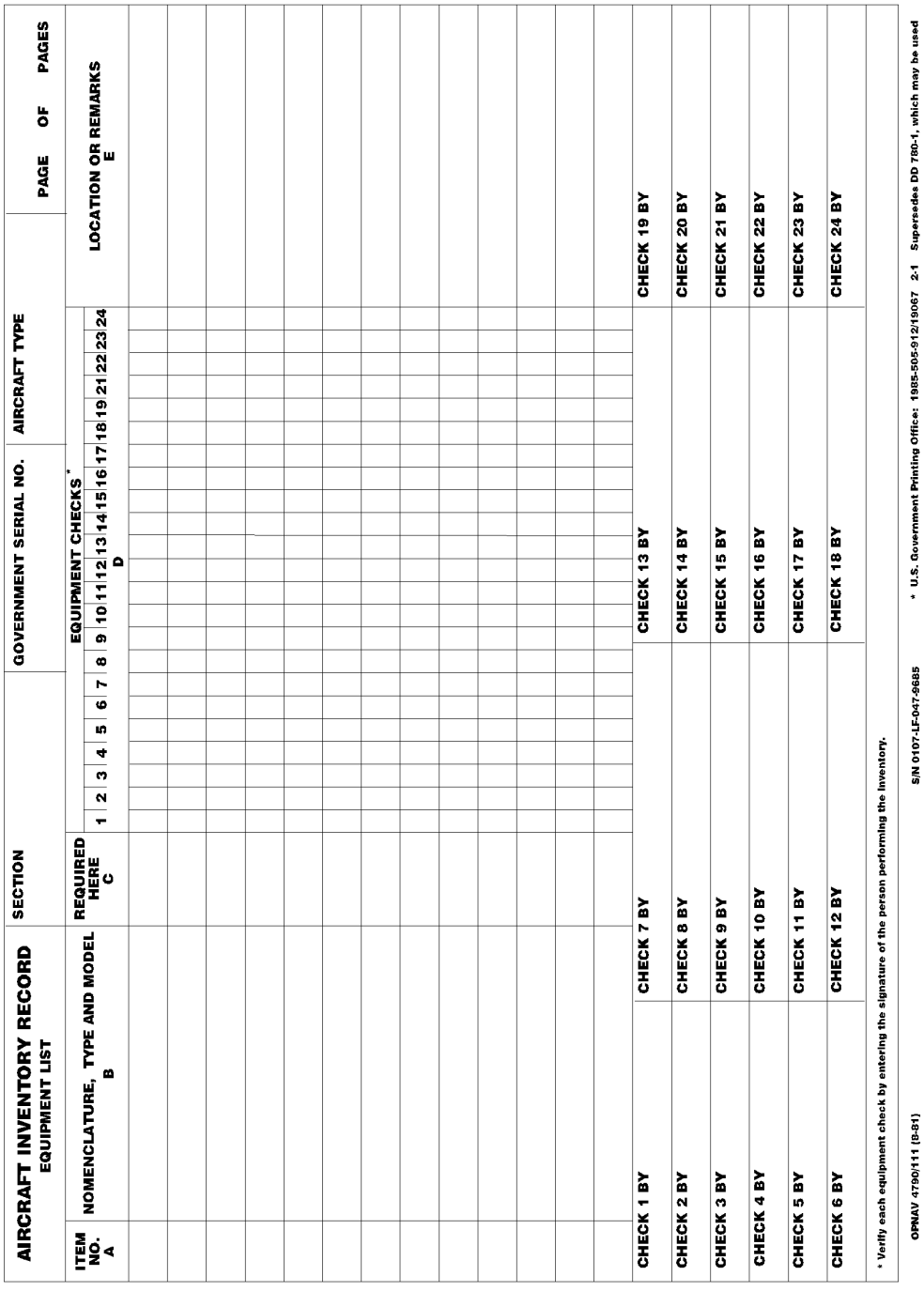


Figure 1. Aircraft Inventory Record, OPNAV 4790/110 (8-81)

Figure 1. Aircraft Inventory Record, OPNAV 4790/110 (8-81)

ENCL (6) TO COMDTINST M13020.1E



AIRCRAFT INVENTORY RECORD
EQUIPMENT LIST

GOVERNMENT SERIAL NO.

AIRCRAFT TYPE

PAGE OF PAGES

ITEM NO. A	NOMENCLATURE, TYPE AND MODEL B	SECTION REQUIRED HERE C	EQUIPMENT CHECKS* 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 21 22 23 24 D	LOCATION OR REMARKS E

CHECK 1 BY	CHECK 7 BY	CHECK 13 BY	CHECK 19 BY
CHECK 2 BY	CHECK 8 BY	CHECK 14 BY	CHECK 20 BY
CHECK 3 BY	CHECK 9 BY	CHECK 15 BY	CHECK 21 BY
CHECK 4 BY	CHECK 10 BY	CHECK 16 BY	CHECK 22 BY
CHECK 5 BY	CHECK 11 BY	CHECK 17 BY	CHECK 23 BY
CHECK 6 BY	CHECK 12 BY	CHECK 18 BY	CHECK 24 BY

* Verify each equipment check by entering the signature of the person performing the inventory.

OPNAV 4790/111 (8-81) S/N 0107-LF-047-9685 * U.S. Government Printing Office: 1985-505-912/19067 2-1 Supersedes DD 780-1, which may be used

Figure 2. Aircraft Inventory Record Equipment List, OPNAV 4790/111 (8-81)

ENCL (6) TO COMDTINST M13020.1E

AIRCRAFT INVENTORY RECORD SHORTAGES		GOVERNMENT SERIAL NO.		AIRCRAFT TYPE	PAGE OF PAGES
ITEM NO. A	NOMENCLATURE, TYPE AND MODEL B	QUANTITY SHORT C	AUTHORITY OR REASON FOR SHORTAGE D		REMARKS E
NAME OF TRANSFERRING/RECEIVING ACTIVITY:					
EQUIPMENT CHECK#/ CERTIFICATION #:					
DATE:					
SIGNATURE OF TRANSFERRING ACTIVITY COMMANDING OFFICER OR A REPRESENTATIVE AUTHORIZED TO SIGN BY DIRECTION:					

OPNAV 4790/112(8-81) S/N 0107-LF-047-9570 Supersedes DD780-2, which may be used ☆ U.S. Government Printing Office: 1985-505-012/18059 2-1

Figure 3. Aircraft Inventory Record Shortages, OPNAV 4790/112 (8-81)

Figure 3. Aircraft Inventory Record Shortages, OPNAV 4790/112 (8-81)

ENCL (6) TO COMDTINST M13020.1E

AIRCRAFT INVENTORY RECORD CERTIFICATION AND RECORD OF TRANSFERS			PAGE OF
NAME OF PRIME CONTRACTOR	GOVERNMENT SERIAL NO.	CONTRACT NUMBER	AIRCRAFT TYPE
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME OF DELIVERY, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	TRANSFERRED FROM	DATE TRANSFERRED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME RECEIPT, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	RECEIVED BY	DATE RECEIVED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME OF DELIVERY, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	TRANSFERRED FROM	DATE TRANSFERRED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME RECEIPT, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	RECEIVED BY	DATE RECEIVED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME OF DELIVERY, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	TRANSFERRED FROM	DATE TRANSFERRED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME RECEIPT, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	RECEIVED BY	DATE RECEIVED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME OF DELIVERY, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	TRANSFERRED FROM	DATE TRANSFERRED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION
I CERTIFY THAT THIS AIRCRAFT, AT THE TIME RECEIPT, WAS INVENTORIED IN ACCORDANCE WITH OPNAVINST 4790.2C AND WAS EQUIPPED WITH ALL ITEMS REQUIRED TO CONSTITUTE A COMPLETE AIRCRAFT WITH THE EXCEPTION OF THOSE ITEMS NOTED ON OPNAV 4790/112.			
CERTIFICATE NUMBER	RECEIVED BY	DATE RECEIVED	SIGNATURE OF GOVERNMENT REP. OR AUTHORIZED AGENT, OFFICIAL TITLE AND ORGANIZATION

OPNAV 4790 104 (REV 9-84) PREVIOUS EDITIONS MAY BE USED UNTIL SUPPLY IS EXHAUSED S/N 0107-LF-047-9628 U.S. Government Printing Office: 1965-505-102/26393 2-1

Figure 4. Aircraft Inventory Record Certification and Record of Transfers, OPNAV 4790 104 (REV 9-84)

Figure 4. Aircraft Inventory Record Certification and Record of Transfers, OPNAV 4790 104 (REV 9-84)

AERONAUTICAL MATERIEL CLASSIFIED AS TYPE 1

A. HC-130

1. T-56-7 Engine
2. T-56-15 Engine
3. Reduction Gearbox
4. Torquemeter

B. HU-25

1. ATF3-6 Engine

C. HH-65

1. LTS-101 Engine
2. Main Gearbox

D. HH-60

1. T700 Engine
2. T62 Auxiliary Power Unit
3. Main Gearbox

ATA SPECIFICATION 100

A. The Air Transport Association of America Specification 100 provides a standard for the presentation of manufacturers' technical data for aircraft, engines, and components. It establishes policy and standards applicable to the commercial manuals the Coast Guard has received with the HU-25 and HH-65 aircraft. The specification is also used in part for numbering of chapters for the Aviation Computerized Maintenance System (ACMS).

NOTE

The Standard Breakdown (paragraph C) has been modified to incorporate the standards of MIL-STD-1808.

B. DEFINITIONS.

1. Publication contents are organized on four levels; Aircraft Group, System/Chapter, Sub-System, and Unit/Subject.

GROUP. Those primary divisions of a publication which enable broad separation of content. Typical of this division is the separation between Airframe Systems and the aircraft Power Plant.

SYSTEM/CHAPTER. Those secondary divisions which permit the subject matter within the Group to be discussed separately.

NOTE

The Systems are also known as Chapters of a manual. Each Chapter is assigned the first element in the standard numbering system (described below).

SUB-SYSTEM/SECTION. Those tertiary divisions which permit a system to be broken into sub-systems. Sub-systems or sections shall be identified by the second element in the standard numbering system.

UNIT/SUBJECT. Those final divisions which permit the identification of the individual units in a system or sub-system. Subjects shall be identified by the third element in the standard numbering system.

NOTE

Unit/Subject numbers are not preassigned; these numbers and their sequence may be selected by the manufacturer to fit the coverage requirements of their publication.

(SYSTEM/CHAPTER) (SUB-SYSTEM/SECTION) (UNIT/SUBJECT). This term describes the complete number when it is referred to as a whole. For example, the number 29-31-03, which contains elements on all levels, may be called the chapter/section/subject number for easier identification and reference.

C. STANDARD BREAKDOWN.

1. Group Aircraft

Systems/Chapter	Title
00	Aircraft-General
01 thru 04	Reserved
05	Time Limits/Maintenance Check
06	Dimensions and Areas
07	Lifting and Shoring

Systems/Chapter	Title
08	Leveling and Weighing
09	Towing and Taxiing
10	Parking, Mooring, Storage and Return to Service
11	Placards and Markings
12	Servicing
13	Equipment Storage
14	Aircraft Loading and Off-Loading
15	Support Equipment
16	Siting Insulation
17	Preparation for Use and Shipment
18	Weapons Instrumentation
19	Reserved

2. Group Airframe Systems

Systems/Chapter	Title
20	Standard Practices Airframe
21	Air Conditioning
22	Auto Flight
23	Communications
24	Electrical Power
25	Equipment/Furnishings
26	Fire Protection
27	Flight Controls
28	Fuel
29	Hydraulic Power
30	Ice and Rain Protection
31	Indicating and Recording Systems
32	Landing Gear
33	Lights
34	Navigation
35	Oxygen
36	Pneumatics

Systems/Chapter	Title
37	Vacuum
38	Water/Waste
39	Electrical/Electronic Components and Multifunction Units
40	Standard Practices - Integrated Avionics
41	Water Ballast
42	Integrated Avionics Architecture
43	Communications - Staff
44	In-Flight Refueling - Tanker
45	Central Maintenance System (CMS)
46	System Integration and Display
47	Liquid/Gaseous Nitrogen
48	Reserved
49	Airborne Auxiliary Power
51	Standard Practices and Structures General
52	Doors
53	Fuselage
54	Nacelles/Pylons
55	Stabilizers
56	Windows
57	Wings
58 and 59	Reserved

3. Group Propeller

Systems/Chapter	Title
60	Standard Practices Propeller
61	Propellers
62	Rotors
63	Rotor Drive(s)
64	Tail Rotor
65	Tail Rotor Drive
66	Folding Blades/Pylon

Systems/Chapter	Title
67	Rotors Flight Control
68 and 69	Reserved

4. Group Power Plant

Systems/Chapter	Title
70	Standard Practices Engines
71	Power Plant 72 Engine
72	Engine Turbine/Turboprop
72	Engine Reciprocating
73	Engine Fuel and Control
74	Ignition
75	Air
76	Engine Controls
77	Engine Indicating
78	Exhaust
79	Oil
80	Starting
81	Turbines
82	Water Injection
83	Accessory Gear-Boxes
84	Propulsion Augmentation
85 thru 90	Reserved

5. Miscellaneous

Systems/Chapter	Title
91	Charts
92	Electrical Power Multiplexing
93	Electronic Warfare
94	Weapon System
95	Crew Escape and Safety
96	Missiles, Drones and Telemetry
97	Image Recording

Systems/Chapter	Title
98	Meteorological and Atmospheric Research
99	Surveillance

D. STANDARD NUMBERING SYSTEM. The numbering system is a conventional class-number breakdown. It provides a means for dividing materiel into Chapter, Section, Subject, and Page. The number is composed of three elements which consist of two digits each.

FIRST ELEMENT		SECOND ELEMENT		THIRD ELEMENT	
CHAPTER (SYSTEM)		SECTION (SUB-SYSTEM)		SUBJECT (UNIT)	COVERAGE
26 (SYSTEM) "FIRE PROTECTION"	-	00	-	00	Materiel which is applicable to the system as a whole.
26	-	20 (SUB-SYSTEM) "EXTINGUISHING"	-	00	Materiel which is applicable to Sub-System as a whole.
26	-	22 (SUB-SUB-SYSTEM) "ENGINE FIRE EXTINGUISHING"	-	00	Materiel which is applicable to Sub-Sub System as a whole. This number (digit) is assigned by the manufacturer.
26	-	22 (UNIT) "BOTTLES"	-	03	Materiel which is applicable to a specific unit of the Sub-Sub-System. Both digits are assigned by the manufacturer.

E. SPECIFIC PUBLICATIONS

Code	HU-25	HH-65
LOAP	TIMOS MPI	TIMOS MPI
Aircraft Maintenance Manual	1U-25A-2	1H-65A-2-1
Wiring Manual	1U-25A-2-9	1H-65A-2-2
Structural Repair Manual	1U-25A-3	1H-65A-3
Illustrated Parts Catalog	1U-25A-4	1H-65A-4
Component Maintenance Manual	1U-25A-11 (Series)	1H-65A-11(Series)
Tool Equipment Manual	32A-25A-2	32H-65A2

Weight and Balance Manual	1U-25A-5	01-1B-40
Non-Destructive Testing	1U-25A-36	1H-65A-36
Manual Corrosion Control Manual	1U-25A-23	
Avionics Maintenance	1U-25A-2-8	1H-65A-2-3
Ground Support	35U-25A-2	
Engine Manual	2J-ATF3-2-2	1H-65A-11-72-2B2
Tool, Equipment, and Component Maint.	32A-ATF3-2	
Power Plant Build-Up	2J-ATF3-10	
Engine Overhaul Manual		1H-65A-11-72-11B2
Engine Light Maintenance Manual	2J-ATF3-2-1	
Engine Heavy Maintenance Manual	2J-ATF3-2-2	
Inspection and Repair Manual	2J-ATF3-2-3	
Engine Illustrated Parts Catalog	2J-ATF3-4	1H-65A-11-72-4B-2
Warranty Manual	00-25A-38	
Aircraft Overhaul Manual		1H-65A-101

DESIGNATION/RECOMMENDATION OF QUALITY ASSURANCE INSPECTOR

From: Quality Assurance Officer

To: Engineering Officer

Subj: Quality Assurance Inspector; Designation/Recommendation of

Ref: a. Appendix A, Air Operations Manual, COMDTINST M3710 (series)

b. Chapter 9, Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1 (series)

1. In accordance with references a. and b. the following person is recommended for primary Q.A. Inspector _____Collateral Duty Q.A. Inspector _____ for the following systems:

NAME	SSN	DATE

Certification: I understand my responsibility as set forth herein:

"An individual, when performing inspections, is considered to be the direct representative of the Commanding Officer for ensuring safety of flight of the item concerned. He/she shall not permit factors such as operational desires, maintenance consideration, personal relations, or the approach of liberty to modify his/her judgment. By signing an inspection report, the inspector is certifying upon his/her own individual responsibility that the work involved has been personally inspected by him/her; that it is satisfactory; that any related parts or components which may have been removed to accomplish the work are properly replaced and all parts are secure; that the work has been performed in such a manner that the item is completely safe for flight."

SIGNATURE OF CANDIDATE	SIGNATURE OF Q.A. OFFICER	DATE

FIRST ENDORSEMENT

From: Engineering Officer

To:

1. You are hereby designated Quality Assurance Inspector as recommended above.

2. You shall perform your assigned duties in accordance with the provisions of reference a.

SIGNATURE	DATE

Copy to: Quality Assurance Officer
Aviation Engineering Section Files

ENCL (10) TO COMDTINST M13020.1E

MAINTENANCE INSTRUCTION

1. ORIGINATING ACTIVITY	2. DATE	3. MAINTENANCE INSTRUCTION NO.
4. SUBJECT		
5. REFERENCE		
6. APPLICABLE WORK CENTERS		
7.	ACTION	

8. SUBMITTED BY (Signature of Operating Officer)	9. APPROVED BY (Signature of Maintenance Officer)

OPNAV 4790/35 (REV.8-81) S/N 0107-LF-047-9177 U.S. Government Printing Office

e10001

Figure 1. Maintenance Instruction, OPNAV 4790/35 (REV. 8-81) S/N 0107-LF-047-9177

AVIATION UNIT REFUELING VEHICLE ALLOWANCE LIST

UNIT	NO	ALLOWANCE CAPACITY (Gal)
Astoria	2	5000
Barbers Point	2	5000
Borinquen	2	5000
Cape Cod	3	5000
Clearwater	3	5000
Clearwater	2	2000
Detroit	2	2000
Elizabeth City	4	5000
Houston	1	2000
Humboldt Bay	1	2000
Kodiak	3	5000
Los Angeles	1	2000
New Orleans	2	2000
Miami	1	5000
Mobile	4	5000
North Bend	1	2000
Port Angeles	1	2000
San Francisco	1	5000
Savannah	1	2000
Traverse City	1	5000

The aviation units listed below do not require refueling vehicles. These units either have reliable flight line fuel pits installed or are adequately supported by commercial or DOD activities.

UNIT
Brooklyn
Cape May
Corpus Christi
Sacramento
San Diego
Sitka
Washington

ALLOWANCE LIST FOR AIRCRAFT TOW TRACTORS

Unit	Medium	Large
ARSC	8	
Astoria	3	
ATC Mobile	9	
Barbers Point	3	2
Borinquen	2	2
Brooklyn	3	
Cape Cod	5	
Cape May	2	
Clearwater	10	3
Corpus Christi	4	
Detroit	2	
Elizabeth City	3	3
Houston	2	
Humboldt Bay	2	
Kodiak	6	3
Los Angeles	2	
Miami	10	
New Orleans	2	
North Bend	3	
Port Angeles	2	
Sacramento	2	2
San Francisco	2	
San Diego	3	
Savannah	3	
Sitka	2	
Traverse City	4	
Washington	1	1

NOTE

Medium - Up to 10,000 pound draw bar pull
Large - 18,000 pound or greater draw bar pull

ALLOWANCE LIST FOR GROUND POWER UNITS AND AIR START CARTS

GROUND POWER UNITS

Unit	Allowance
ARSC	3
Astoria	2
ATC Mobile	7
Barbers Point	3
Borinquen	3
Brooklyn	2
Cape Cod	3
Cape May	2
Clearwater 1	0
Corpus Christi	2
Detroit	1
Elizabeth City	4
Houston	2
Humboldt Bay	1
Kodiak	6
Los Angeles	1
Miami	8
New Orleans	2
North Bend	2
Port Angeles	1
Sacramento	3
San Diego	2
San Francisco	1
Savannah	2
Sitka	2
Traverse City	2
Washington	1

AIR START CARTS

Unit	Allowance
ARSC	1
ATC Mobile	2
Clearwater	2
Elizabeth City	1
Kodiak	1

ALLOWANCE LISTS FOR TEST CELLS, FORKLIFTS, DECK SWEEPERS, AND PORTABLE CRANES

ALLOWANCE FOR HC-130 CARGO HANDLING FORKLIFTS

Barbers Point	1
Clearwater	2
Elizabeth City	1
Kodiak	3
Sacramento	1
Borinquen	1

ALLOWANCE FOR HANGAR DECK SWEEPERS

ARSC	1
Astoria	1
ATC Mobile	2
Barbers Point	1
Brooklyn	1
Borinquen	2
Cape May	1
Cape Cod	2
Clearwater	2
Corpus Christi	1
Detroit	1
Elizabeth City	2
Houston	1
Humboldt Bay	1
Kodiak	3
Los Angeles	1
Miami	2
New Orleans	1
North Bend	1
Port Angeles	1
Sacramento	1
San Diego	1
San Francisco	1
Savannah	1
Sitka	1
Traverse City	1
Washington	1

AVIATION UNITS WITH T-700 JET ENGINE TEST CELLS

ARSC

ALLOWANCE FOR C-130 PORTABLE CRANE

Barbers Point	1
Borinquen	1
Clearwater	2
Elizabeth City	1
Kodiak	1
Sacramento	1

ALLOWANCE LIST FOR HU-25, HH-65, AND HH-60 HYDRAULIC JENNY AND GROUND AIR CONDITIONING UNIT (GACU)

	HU-25		HH-65	
UNIT	HYD JENNY	GACU	HYD JENNY	GACU
ARSC	2	2	3	3
ASTORIA	1	1	1	1
ATTC			1	1
ATC Mobile	1	1	3	3
Barbers PT			1	1
Brooklyn			2	2
Borinquen			1	1
Cape May			1	1
Cape Cod			1	1
Corpus Christi	1	1	1	1
Detroit			1	1
Houston			1	1
Humboldt Bay			1	1
Kodiak			1	1
Los Angeles			1	1
Miami	1	1	3	3
New Orleans			2	2
North Bend			1	1
Port Angeles			1	1
San Diego	1	1	1	1
Savannah			1	1
Traverse City			2	2

	HH-60	
UNIT	HYD JENNY	GACU
ARSC	2	
Astoria	1	

HH-60

UNIT	HYD	JENNY	GACU
ATTC		3	
Cape Cod		1	
Clearwater		6	
Elizabeth City		1	
Kodiak		1	
San Francisco		1	

MINIMUM INSPECTION REQUIREMENTS FOR MOBILE GSE

A. DAILY

1. Check fuel, oil, radiator systems for leaks/proper uid level.
2. Check brakes, lights, and indicating systems for proper operation.
3. Check fire extinguisher for condition/security.
4. Check general condition of unit (static and operationally).

B. WEEKLY

1. Check tires for wear/proper in ation.
2. Check battery electrolyte level.
3. Check power units for proper voltage/frequency output, and cables for wear.
4. Check transmission uid.
5. Check brake uid.
6. Check power steering uid.
7. Check all belts for wear/deterioration.
8. Check air filter.
9. Check parking brakes for proper operation.
10. Check for cleanliness.

C. QUARTERLY

1. Service battery.
2. Adjust brakes.
3. Perform complete tune-up.
4. Perform complete lube, change crankcase oil/oil filter.
5. Check for anti-freeze protection.
6. Check accelerator linkage for wear/security.
7. Check steering linkage for wear/security.
8. Check intake/exhaust systems for leaks/security.
9. Check tow hitches for security.
10. Check all hose lines for wear/deterioration.
11. Check electrical connections, relays, etc., for evidence of arcing/sparking.

D. SEMI-ANNUAL

1. Inspect mobile electric power cart, cable and plug assemblies IAW NAVAIR 17-1-116.

E. ANNUAL

1. Inspect and repack wheel bearings.
2. Drain, clean, and reservice cooling system.
3. Change fuel filter(s).

4. Inspect, weigh, and service fire extinguisher.

5. Detailed inspection for general condition.

F. 60 MONTHS (GROUND POWER UNITS ONLY)

1. Replace AC/DC power cable and plug assemblies IAW NAVAIR 17-1-116.

HAND SIGNALS FOR AIRCRAFT

HAND SIGNALS FOR FIXED WING AIRCRAFT

SIGNAL FROM DIRECTOR TO PILOT

1

I HAVE COMMAND

DAY - Holds one hand open with palm forward, motionless high overhead.
NIGHT - Holds one hand with wand motionless high over-head.

SIGNAL FROM DIRECTOR TO PILOT

2

CONNECT AUXILIARY POWER UNIT

DAY - Holds extended index finger of right hand against the flat palm of vertical left hand.
NIGHT - Same as day except makes plugging action with wands.

REMARKS - Signal is initiated by pilot, repeated by director, and executed by deck crew.

SIGNAL FROM PILOT TO DIRECTOR

3

DISCONNECT AUXILIARY POWER UNIT

DAY - Pulls extended index finger of right hand from palm of left hand.
NIGHT - Same as day except makes unplugging action with wands.

REMARKS - Signal is initiated by pilot, repeated by director, and executed by deck crew.

SIGNAL FROM DIRECTOR TO PILOT

4

DISCONNECT AUXILIARY POWER UNIT

DAY - Pulls extended index finger of right hand from palm of left hand.
NIGHT - Same as day except makes unplugging action with wands.

REMARKS - Signal is initiated by pilot, repeated by director, and executed by deck crew.

SIGNAL FROM PILOT TO DIRECTOR

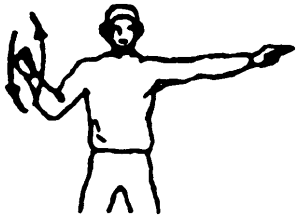
5

READY TO START ENGINE

DAY - Moves hand in circle perpendicular to the deck; follows with a "thumbs up" signal. Copilot signals for No. 1 engine; pilot signals for No. 2.
NIGHT - Turns on ashlight or movable light and moves it in a circle perpendicular to the deck.

SIGNAL FROM DIRECTOR TO PILOT

6

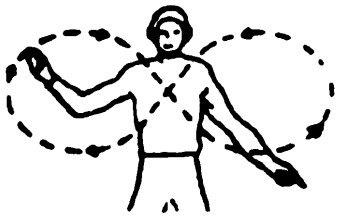


START ENGINES

DAY - Gives "Emergency Stop" to ensure that brakes are on. Points at engine to be started while rotating other hand in a cranking motion.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

7



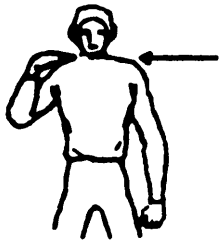
ENGINES FIRE

DAY - Describes a large figure eight with one hand and points to the fire area with the other hand.
NIGHT - Same as day except with wands.

REMARKS - Signal is meant for information only. Pilot should be given a cut engine or continuous turn-up signal, as appropriate.

SIGNAL FROM DIRECTOR TO PILOT

8

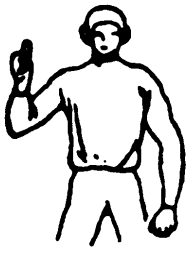


CUT ENGINES

DAY - Makes "Throat Cutting" action with one hand. For multi-engine aircraft, points to appropriate engine with other hand.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

9

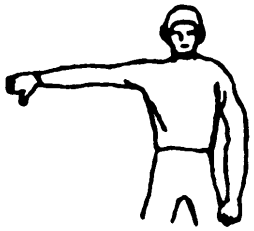


THUMBS UP

DAY - Holds fist at shoulder level with thumb extended up. Given by pilot when he desires to start engine or taxi.
NIGHT - Holds wand in "Thumbs Up" position.
REMARKS - "Thumbs Up" reply indicates "all clear."

SIGNAL FROM DIRECTOR TO PILOT

10



THUMBS DOWN

DAY - Holds fist at shoulder level with thumb extended down.
NIGHT - Holds wand in "Thumbs Down" position.

REMARKS - Indicates that all is not OK.

SIGNAL FROM DIRECTOR TO PILOT

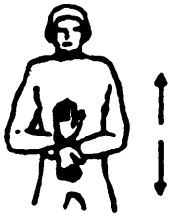
11

OPEN COWL FLAPS

DAY - Holds hands against side of head. Opens hands by moving thumbs forward and outward.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

12



LOWER WING FLAPS

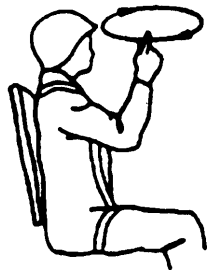
DAY - Positions hands in front of body, with palms together horizontally. Opens palms from wrists, alligator mouth fashion.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

13
RAISE WING FLAPS
Reverse of LOWER WING FLAPS signal.

SIGNAL FROM PILOT TO DIRECTOR

14



READY TO ENGAGE ROTORS

DAY - Moves hand in horizontal circle with index finger at eye level.
NIGHT - Same as day except holds red light in hand.

SIGNAL FROM DIRECTOR TO PILOT

15

ENGAGE ROTORS

DAY - Facing pilot, holds left hand (fist clenched) above head. Moves right hand in horizontal circle with index finger at eye level.
NIGHT - Facing pilot, holds red wand in left hand above head. Moves right hand in horizontal circle with index finger at eye level.

SIGNAL FROM DIRECTOR TO LINE CREW

16

REMOVE TIEDOWNS

DAY - Makes wiping motion down left arm with right hand.
NIGHT - Same as day except with wands.

SIGNAL FROM PILOT TO DIRECTOR

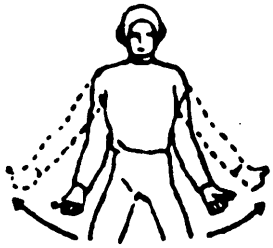
17

REMOVE CHOCKS

DAY - Swings arms apart; extends thumbs outward.
NIGHT - Using hand light or ashlight, gives on/off signals at one second intervals.

SIGNAL FROM DIRECTOR TO LINE CREW

18

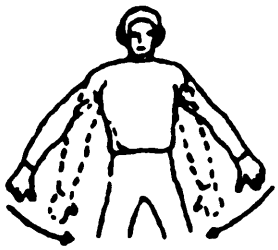


REMOVE CHOCKS

DAY - Gives "Emergency Stop" signal to ensure that brakes are ON. Sweeps fists apart at hip level with thumbs extended and pointing outward.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO LINE CREW

19



INSERT CHOCKS

DAY - Sweeps fists together at hip level with thumbs extended and pointing inward.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO LINE CREW

20

REMOVE DOWNLOCKS

DAY - Holds arms overhead with right hand clasping left forearm. Unclasps right hand from forearm and straightens right arm from elbow.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO LINE CREW

21

INSTALL DOWNLOCKS

DAY - Holds arms overhead with right hand clasping left forearm.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

22

UNLOCK TAIL WHEEL

DAY - Positions hands overhead with palms together. Opens palms from wrists to form a vertical "V."
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

23

LOCK TAIL WHEEL

DAY - Positions hands overhead with palms forming a vertical "V." Closes palms suddenly.
NIGHT - Same as day except with wands.

SIGNAL FROM PILOT TO DIRECTOR

24

READY FOR TAKEOFF / TAXI

DAY - Gives "thumbs up" signal at eye level.
NIGHT - May give "up" signal by turning on ashlight or other movable light and moving it up and down.

SIGNAL FROM DIRECTOR TO PILOT

25

MOVE FORWARD

DAY - With hands at head level and palms toward face, makes closing motions toward head.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

26

LEFT TURN

DAY - Makes beckoning action with left hand, while pointing at left brake with right hand, index finger extended.
NIGHT - Same as day except with wands.

REMARKS - For HARD TURN, clench fist pointing to brake. For FAST TURN, open hand pointing to brake. At night, vary the rate of beckoning motion to indicate desired rate of turn.

SIGNAL FROM DIRECTOR TO PILOT

27

RIGHT TURN

Reverse of LEFT TURN signal.

SIGNAL FROM DIRECTOR TO PILOT

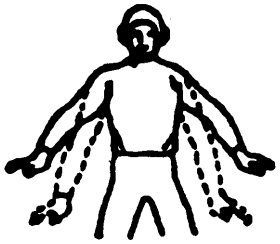
28

PROCEED UNDER GUIDANCE OF NEXT DIRECTOR

DAY - Moves both hands at shoulder height, with arms extended, both pointing to the next director.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

29



SLOW DOWN

DAY - Raises arms to waist level, palms down. Makes a downward patting motion.
NIGHT - Same except with wands, held horizontally.

SIGNAL FROM DIRECTOR TO PILOT

30

ROLL BACK

DAY - Raises both hands to eye level, palms to pilot, in policeman's "stop."
NIGHT - Holds crossed wands overhead.

SIGNAL FROM DIRECTOR TO PILOT

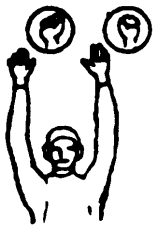
31

EMERGENCY STOP

DAY - Crosses forearms overhead with fists clenched.
NIGHT - Crosses wands overhead.

SIGNAL FROM DIRECTOR TO PILOT

32



HOLD BRAKES

DAY - Clenches fists overhead with arms uncrossed.

SIGNAL FROM DIRECTOR TO PILOT

33

RELEASE BRAKES

DAY - Opens and clenches fists as arms are held above head.

SIGNAL FROM DIRECTOR TO PILOT

34

DROOP STOPS OUT

DAY - When rotor starts to "run down" taxi signalman stands with both hands raised above head, fists closed, thumbs pointing out.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

35

DROOP STOPS IN

DAY - When droop stops go in, taxi signalman turns thumbs inwards.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

36

ROLL BACK

DAY - Arms down, palms open facing forward, sweeping backward and forward movement with the arms.

SIGNAL FROM DIRECTOR TO PILOT

37

TURNS WHILE BACKING – TAIL TO PORT

DAY - Point right arm down and bring left arm from overhead vertical position to horizontal forward position, repeating left arm movement.

SIGNAL FROM DIRECTOR TO PILOT

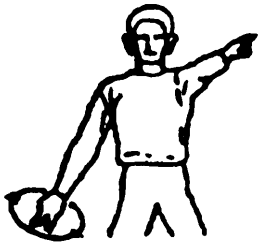
38

TURNS WHILE BACKING – TAIL TO STARBOARD

DAY - Reverse of TURNS WHILE BACKING - TAIL TO PORT (LEFT).

SIGNAL FROM DIRECTOR TO PILOT

39



START AIRCRAFT AUXILIARY POWER UNIT

DAY - Points to power unit exhaust with left hand index finger. Moves right hand in horizontal circle, index and middle fingers pointing downward.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO PILOT

40

STOP AUXILIARY POWER UNIT

DAY - Makes "Throat Cutting" action with left hand. Moves right hand in horizontal circle, index and middle fingers pointing downward.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO LINE CREW

41

INSTALL TIEDOWNS

DAY - Rotates hands in a circle perpendicular to and in front of his body.
NIGHT - Same as day except with wands.

SIGNAL FROM DIRECTOR TO LINE CREW

42

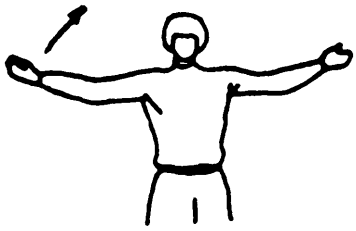
TIEDOWNS IN PLACE

DAY - Same signals as INSTALL TIEDOWNS followed by thumbs up.
NIGHT - Same as day except with wands.

HAND SIGNALS FOR AIRBORNE HELICOPTERS

SIGNAL FROM DIRECTOR TO PILOT

1

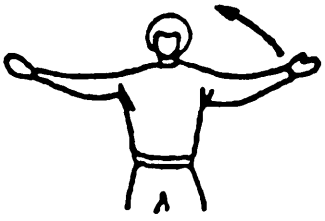


MOVE RIGHT

DAY - Left arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction in a repeating movement.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

2

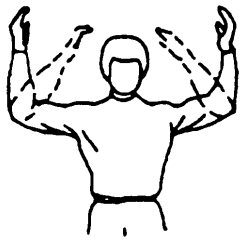


MOVE LEFT

DAY - Right arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction in a repeating movement.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

3

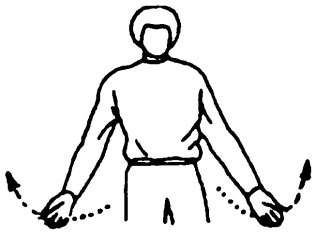


MOVE FORWARD

DAY - With hands at head level and palms toward face, makes closing motions toward head.
NIGHT - Same as day except uses green wands.

SIGNAL FROM DIRECTOR TO PILOT

4



MOVE BACK

DAY - Arms by sides, palms facing forward, swept forward and upward repeatedly to shoulder height.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

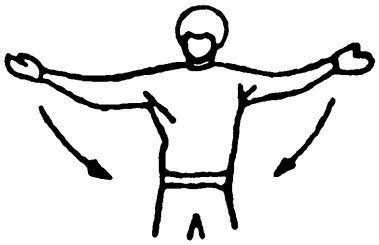
5

MOVE UPWARD

DAY - Arms extended horizontally sideways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

6

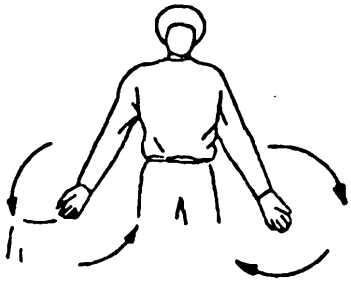


MOVE DOWNWARD

DAY - Arms extended horizontally sideways beckoning downwards, with palms turned down. Speed of movement indicates rate of ascent.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

7

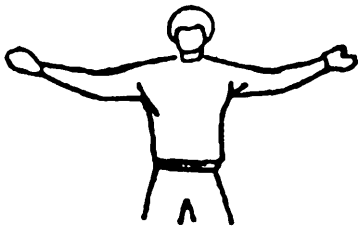


GEAR DOWN

DAY - When aircraft approaches with landing gear retracted, taxi signalman makes circular motion with arms down 45 degrees and ahead 45 degrees.
NIGHT - Same as day with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

8

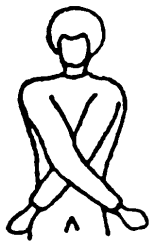


HOVER

DAY - Arms extended horizontally sideways, palms downward.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

9



LAND

DAY - Arms crossed and extended downwards in front of the body.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

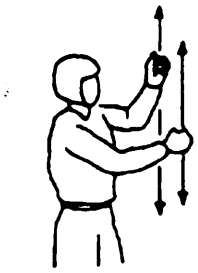
10

WAVEOFF

DAY - Crosses and uncrosses arms overhead.
NIGHT - Same as day except uses green wands.
NOTE - Applies regardless of color of signal device.
MANDATORY SIGNAL.

SIGNAL FROM DIRECTOR TO PILOT AND HOOKUP CREW

11



HOOK UP EXTERNAL LOAD

DAY - Makes a rope climbing action, to the side. Once hookup is completed and cargo hookup man gives "thumbs up" signal, taxi signalman gives "launch" signal to pilot.
NIGHT - Same as day except uses green wands; holds wands vertical and moves them in a vertical plane.

SIGNAL FROM DIRECTOR TO PILOT

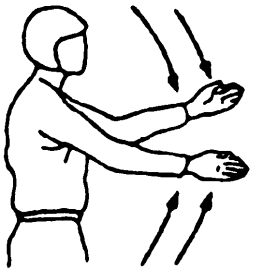
12

RELEASE LOAD

DAY - Left arm extended forward horizontally fist clenched, right hand making horizontal slicing movement below the left fist, palm downward.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

13

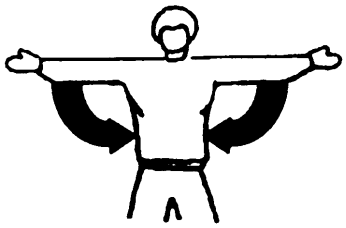


HOOK NOT DOWN / UP

DAY - With arms extended make short up and down chopping action alternating hands.
NIGHT - Same as day except uses green wands.

SIGNAL FROM DIRECTOR TO PILOT

14

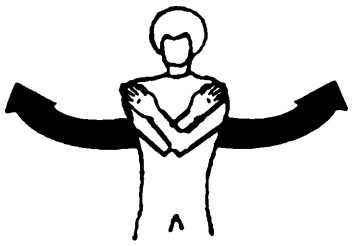


FOLD WINGS/ HELICOPTER BLADES

DAY - Arms straight out at sides, then swept forward and hugged around shoulders.
NIGHT - Same as day signal with addition of wands.

SIGNAL FROM DIRECTOR TO PILOT

15



SPREAD WINGS/ HELICOPTER BLADES

DAY - Arms hugged around shoulders then swept straight out to the sides.
NIGHT - Same as day signal with addition of wands.

NOTE

For Shipboard Helicopter Handling Procedures see COMDTINST M3710.2 (series).

RECOMMENDATIONS FOR AVIONICS TECHNICAL LIBRARIES

A. USCG PUBLICATIONS.

Number	Title
COMDTINST M10550.25 (series)	Aeronautical Engineering Newsletters Electronics Manual
COMDTINST M13020.1 (series)	Aeronautical Engineering Maintenance Management Manual
COMDTINST M2000.3 (series)	Telecommunications Manual
AFTO 00-25-234	General Shop Practices for the Repair, Maintenance, and Test of Electronic Equipment
NAVAIR 01-1A-505	Installation Practices for Aircraft Electric and Electronic Wiring
MIL-W-5088L	Wiring, Aerospace Vehicle
COMDTINST M5100.47 (Series)	Safety and Environmental Health Manual

B. COMMERCIAL PUBLICATIONS.

Title	Publisher
Reference Data for Radio Engineering	Howard W. Sams
Dictionary of Physics and Electronics	D. Van Nostrand, Co.
Aircraft Electricity and Electronics, Bert McKinley	McGraw Hill Book, Co.
Radar Technology, Eli Brookner	ARTECH House, Inc.
Logistics Engineering and Management, Benjamin S. Blanchard	Prentice-Hall
Avionics Navigation Systems	John Wiley & Sons, Inc. Kayton & Fried, Editors
IEEE Standard Dictionary of Institute of Electrical and Electronic Terms and Electronic Engineers, Inc.	IEEE
Standard Handbook for Electrical Engineers, Finks & Carroll	McGraw Hill Book, Co.
Electronic Engineers Handbook, Finks	McGraw Hill Book, Co.
Introduction to Radar Systems, Merrill I. Skolnik	McGraw Hill Book, Co.

Title	Publisher
Electrical Engineers Master Catalogue United Technical	Finks Publications
Specification for Manufacturers' Air Transport Association A.T.A. Spec. No. 100	Technical Data of America

C. NAVY PUBLICATIONS.

Publication Number	National Stock Number	Title
NA 00-500A		Naval Aeronautical Publications Index, Equipment Applicability List
NA 16-1-521	0816-LP-000-4000	Reduction of Radio Interference in Aircraft, Installation and Maintenance Practices
	0967-LP-031-1000	Miniature Parts and Integrated Circuit Devices for Electronic Equipment
NA 16-1-540		Avionic Cleaning and Corrosion Control Organizational Intermediate Maintenance

D. AIR FORCE TECHNICAL ORDERS.

Number	Title
00-20-14	AF Metrology and Calibration Program
00-25-251	Installation, Operation, Maintenance, Care, and Handling Instructions General - Microwave, Magnetron, and Electron Tubes
1-1-24	Maintenance Repair and Electrical Requirements for Fiberglass Airborne Radomes
1-1A-14	Installation Practices for Aircraft Electric and Electronic Wiring
12R-2-122	General Maintenance, Installation Instruction - Aircraft Fixed Wire Antennas
31-1-141-1 Thru -15	Basic Electronics Technology and Testing Practices

COMPOSITE REPAIR MATERIELS - MAINTAINED BY UNIT

EQUIPMENT

TRANSDUCER ASSY

VACUUM PORT

HOSE ASSY

VACUUM GAGE

PYROMETER

HOT BONDER

THERMOCOUPLE WIRE (J TYPE)

THERMOCOUPLE WELDER

HEAT LAMP

VACUUM, HEPA

TRIPLE BEAM SCALE

CONSUMABLES

VACUUM BAG SEALANT TAPE

NYLON BAGGING FILM

10 oz AIRWEAVE BREATHER/BLEEDER CLOTH

4 oz AIRWEAVE BREATHER/BLEEDER CLOTH

POROUS TEFLON

NON-POROUS TEFLON

SMOOTHER, 5103

RESIN, HYSOL 9309.3NA

RESIN, HYSOL 956

RESIN, EPON 828

CATALYST, DTA (EPON 828)

SCRIM CLOTH (HH-60 ONLY)

CHEESE CLOTH

COTTON SWABS

PAPER CUPS

CLOTH GLOVES

SURGICAL GLOVES

STIR STICKS/TONGUE DEPRESSORS

FLASHBREAKER TAPE

HAND TOOLS

SCISSORS, 6" UTILITY

PINKING SHEARS

TWEEZERS

TEFLON/NYLON SQUEEGEES

DISC ABRASION KIT

8" DIVIDERS

****COMMON HAND TOOLS NOT LISTED**

REFERENCES

1. AIR FORCE T.O. 1-1-690, GENERAL ADVANCED COMPOSITE REPAIR MANUAL
2. USCG 1H-65A-3, STRUCTURAL REPAIR MANUAL
3. A1-H60HA-SRM-000, STRUCTURAL REPAIR - ORGANIZATIONAL AND INTERMEDIATE

NOTE

Due to constantly changing sources and technology, ARSC will maintain and periodically distribute a list of sources and part numbers.

SPECIAL HANDLING PROCEDURES FOR MOS (METAL-OXIDE-SEMICONDUCTOR) DEVICES

A. SPECIAL HANDLING PROCEDURES. MOS devices require special handling procedures since these devices are easily damaged by operators, high electrostatic or AC voltages on poorly grounded equipment, soldering irons, or work areas. To prevent electrical and mechanical damage, the following precautions should be observed when handling/replacing MOS devices or assemblies.

1. All equipment that comes in contact with the MOS devices must be grounded, i.e., test equipment, power supplies, soldering iron tips, etc.

2. All power supplies should be checked to ensure that excessive voltage transients (70-100V) do not occur at turn-ON or turn-OFF.

3. To eliminate the possibility of damage by electrostatic discharge, all maintenance personnel should utilize a "personnel ground device." A personnel ground device consists of a conductive bracelet, a 200K ohm resistor, a length of #20 standard copper insulated wire and a clip/ clamp, connected in series and attached to an adequate "ground."

4. All MOS devices or Shop Replaceable Units (SRUs) with MOS devices not in use should be stored in a conductive package so that all leads/pins are shorted via the package. This allows the SRU/device to be moved or stored by normal handling methods. Special metal foil lined packages, conductive foam, conductive plastic packages, or special shorting sockets/ connectors may be used to ensure proper shorting.

5. All MOS devices and assemblies should be placed on a grounded bench surface (metal or conductive rubber) and the operator grounded before the devices or assemblies are removed from their special conductive packages. Conversely, the devices or assemblies should be placed in their conductive package before removal from the bench area. Make certain that all exposed leads are in contact with the conductive surfaces of the package.

6. Before inserting SRUs with MOS devices into test sockets or subassembly circuits, manually hold the SRU and the test equipment or subassembly chassis simultaneously to ensure all items have a common potential.

7. Care should be exercised when forming device leads in preparation for assembly. The leads should not be bent directly at the lead-to-seal interface, as this could break the seal leading to eventual failure of the device.

8. Pre-tin the device leads before final assembly. All soldering operations should be done as quickly as possible (while being consistent with established soldering techniques) to prevent excessive heating which could damage the device.

9. Care should be taken not to drop the SRU or MOS devices. High G-forces resulting from the drop can cause premature device failures.

SOFTWARE CHANGE PROCEDURE

A. Proposed changes to aircraft software shall be submitted to the appropriate Stan Unit using the Software Change Proposal (SCP) (see Figure 1.). Problems and discrepancies with the aircraft software will be reported using the Trouble Report (TR) (see Figure 2.). The Stan Unit will review, consolidate, and forward all proposed changes to the designated Software Support Activity (SSA).

B. The SSA will confer with the Stan Unit, Commandant (G-SEA), and Commandant (G-OCA) to determine when an Operational Advisory Group (OAG) will convene. The OAG consists of representatives from Commandant (G-WKS), Commandant (G-OCA), Commandant (G-SEA), Stan Unit, ATTC, Prime Unit, the SSA, and each affected unit. The OAG will evaluate and prioritize the proposed changes.

C. The SSA will perform an initial analysis to determine feasibility of the proposals. A package of changes and their initial analysis will be forwarded for Headquarters Aircraft Configuration Control Board (ACCB) Phase I review.

D. The ACCB will review the package and accept or reject each item individually. The ACCB gives the SSA the approval to proceed with development.

E. The SSA will develop the software change. The SSA will coordinate with the Prime Unit to perform both a ground test and a flight test of the software.

F. Prime Unit will send an evaluation report to ARSC. ARSC makes their recommendation and produces a draft TCTO for ACCB (Phase II) review.

G. With final approval, Commandant (G-SEA) will direct ARSC to complete and publish the TCTO. Commandant (G-SEA) will coordinate manual updates, software shipping and loading.

ENCL (21) TO COMDTINST M13020.1E

SOFTWARE CHANGE PROPOSAL (SCP)

TR NUMBER (DBA):	
CHIEF, A&P INITIAL APPROVAL/DISAPPROVAL	DATE/TIME:
CHIEF, A&P REVIEW:	DATE/TIME:
CHIEF, MISD APPROVAL/DISAPPROVAL/PRIORITY:	DATE/TIME:
PROGRAMMER(S) ASSIGNED:	
PROGRAMMER ESTIMATES/RECOMMENDATIONS:	

AFFECTED SUBSYSTEMS (CHECK):

☐ AM	☐ AS	☐ DM	☐ FO
☐ DS	☐ FA	☐ ES	☐ PR

TOTAL ESTIMATED LEVEL OF EFFORT IN MAN-HOURS:	ESTIMATED DOWNTIME FOR DATALOADS, CONVERSIONS, ETC.:

SPECIFIC MODULES AFFECTED - BRIEF DESCRIPTION OF CHANGES TO EACH (ADD ADDITIONAL PAGES IF NEEDED).

DATABASE ADMINISTRATOR: LIST DATABASE IMPACT .

SYSTEM MANAGER: LIST RESOURCE/WORKLOAD REQUIREMENTS:

E21001a

Figure 1. Software Change Proposal (SCP)

ENCL (21) TO COMDTINST M13020.1E

TROUBLE REPORT (TR)

TR NUMBER (DBA):	PRIORITY: ☐ URGENT ☐ ASAP ☐ LOW
TR RECIPIENT: DATE/TIME RECEIVED:	
MISD RECIPIENT:	DATE/TIME RECEIVED:

AMMIS SUBSYSTEM - CHECK AFFECTED SUBSYSTEM(S)

☐ DEPOT MAINTENANCE	☐ ENGINEERING SERVICES	☐ FLIGHT OPERATIONS
☐ FISCAL ACCOUNTING	☐ PROCUREMENT	☐ AMSHELL
☐ AIR STATION SUPPLY	☐ DEPOT SUPPLY	

DESCRIPTION OF CHANGE - BRIEF DESCRIPTION OF PROBLEM OR REQUEST INCLUDING SCREEN NUMBER OR REPORT NAME IF APPLICABLE.

ORIGINATOR INFORMATION - ENTER ALL AVAILABLE INFO

USER NAME:	RANK/RATE:
DUTY STATION:	
DIVISION/DEPT:	
PHONE NUMBER INCLUDING AREA CODE:	
CTOS E-MAIL ADDRESS:	
AMMIS LOGIN NAME:	
FORWARD TO DBA OFFICE:	

E21002a

Figure 2. Trouble Report (TR)

FORMS

A. CG-1577-A, Unsatisfactory Report (UR) Tag-Materiel (11-90) - S/N CG-1577-A - Forms supplied to the air stations by ARSC.

B. CG-22, Aeronautical Publication Change Recommendation (8-91) - Available on Forms Plus Laser and Jetform Filler.

C. CG-4010, Unsatisfactory Report of Aeronautical Equipment (10-94) - Available on Forms Plus Laser and Jetform Filler.

D. CG-4377, Aircraft Flight Record (12-88) - S/N 7530-00-F01-7390, U/I HD - ELC.

E. CG-4377A, Flight Safety Maintenance Document (4-84) - Available on Forms Plus Laser and Jet-form Filler.

F. CG-4377B, NO FLY Form (10-94) - Available on Forms Plus Laser and Jetform Filler.

G. CG-4940, Surf Requisition Log (6-73) - Available on Forms Plus Laser and Jetform Filler.

H. CG-5181, Carry Forward Discrepancies (3-81) - Available on Forms Plus Laser and Jetform Filler.

I. AFTO Form 781J, Airframe and Engine Operating Time and Cycle Information (5-73) -Available on Forms Plus Laser and Jetform Filler.

J. AFTO Form 103, Aircraft/Missile Condition Report (7/88) - Electronic Forms available on the AF-PDL CD.

K. AF Form 847, Recommendation for Change of Publication (8-74) - Available on Forms Plus Laser and Jetform Filler.

L. AFTO Form 290, Aerospace Vehicle Delivery Receipt (7-88) - S/N 1991-548-041/4014 -Stock-point Air Force.

M. DD-1574, Serviceable Tag-Materiel (10-66) - S/N 0102-LF-016-0300 - Forms supplied to the air stations by ARSC.

N. DD-1577-2, Unserviceable (Reparable) Tag-Material (10-66) - S/N 0102-LF-016-0700 -Forms supplied to the air stations by ARSC.

O. DD-2026, Oil Analysis Request (11-77) - Available on Forms Plus Laser and Jetform Filler.

P. DD-2027, Oil Analysis Record (8-76) - S/N 0102-LF-002-0270 - U/I PD - Stockpoint Navy.

Q. DD Form 365-4, Weight and Balance Clearance Form F - Transport/Tactcial (4-89) - S/N 0102-LF-008-8700 - Stockpoint Navy.

R. OPNAV 4790/35, Maintenance Instruction (8-81) - S/N 0107-LF-047-9177 - U/D 100 sheets U/I PD - Stockpoint Navy.

S. OPNAV 4790/66, Technical Publications Deficiency Report (5-88) - S/N 0107-LF-002-4400 - U/D 50 sheets, U/I PD - Stockpoint Navy.

T. OPNAV 4790/104, Aircraft Inventory Record Certification and Record of Transfers (4-87) -S/N 0107-LF-047-9529 - U/D 50 sheets, U/I PD - Stockpoint Navy.

U. OPNAV 4790/110, Aircraft Inventory Record - S/N 0107-LF-047-9560 (8-81), U/D 50 sheets, U/I PD - Stockpoint Navy.

V. OPNAV 4790/111, Aircraft Inventory Record Equipment List - S/N 0107-LF-047-9565 (8-81) - U/D 100 sheets, U/I PD - Stockpoint Navy.

W. OPNAV 4790/112, Aircraft Inventory Record Shortages - S/N 0107-LF-047-9570 (8-81) -U/D 100 sheets, U/I PD - Stockpoint Navy.

X. SF 368, Product Quality Deficiency Report (10-85) - Available on Forms Plus Laser and Jetform Filler.

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